

**GOOD GOVERNANCE OF TAMBON ADMINISTRATIVE
ORGANIZATION IN RESOURCE MANAGEMENT,
TAMBON BANGPLA, AMPHOE BANGLLEN,
NAKHONPATHOM**



**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF SCIENCE
(TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2005**

**ISBN 974-04-5611-1
COPYRIGHT OF MAHIDOL UNIVERSITY**

Thesis
Entitled

**GOOD GOVERNANCE OF TAMBON ADMINISTRATIVE
ORGANIZATION IN RESOURCE MANAGEMENT,
TAMBON BANGPLA, AMPHOE BANGLEN,
NAKHONPATHOM**

M. Nilrat

Miss Maliwan Nilrat
Candidate

S. Dilokwanich

Asst. Prof. Sittipong Dilokwanich,
Ph.D.(Human Geography)
Major-Advisor

S. Pomsiripongse

Assoc. Prof. Saowapa Pomsiripongse,
M.A (Sociology and Anthropology)
Co-Advisor

Thawilwadee Bureekul

Lect. Thawilwadee Bureekul,
Ph.D.(Development Administration
Public Policy)
Co-Advisor

Rassmidara Hoonsawat

Assoc.Prof.Rassmidara Hoonsawat,
Ph.D.
Dean
Faculty of Graduate Studies

Raywadee Roachanakanan

Asst. Prof. Raywadee Roachanakanan,
Ph.D.(Ecology, Evolution and
Systematics)
Chair
Master of Science Programme in
Technology of Environmental
Management
Faculty of Environment and
Resource Studies

Thesis
Entitled

**GOOD GOVERNANCE OF TAMBON ADMINISTRATIVE
ORGANIZATION IN RESOURCE MANAGEMENT,
TAMBON BANGPLA, AMPHOE BANGLEN,
NAKHONPATHOM**

was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Science
(Technology of Environmental Management)

on
24 February, 2005

M. Nilrat

Miss Maliwan Nilrat
Candidate

S. Dilokwanich

Asst.Prof. Sittipong Dilokwanich,
Ph.D.(Human Geography)
Chair

S. Pornsiri

Assoc.Prof. Saowapa Pornsiripongse,
M.A.(Sociology and Anthropology)
Member

J. Euarukskul

Asst.Prof. Julaporn Euarukskul,
Ph.D.(Politics)
Member

T. Bureekul

Lect. Thawilwadee Bureekul,
Ph.D.(Development Administration
Public Policy)
Member

R. Hoonsawat

Assoc.Prof. Rassmidara Hoonsawat,
Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University

A. Pongsomlee

Assoc.Prof. Anuchat Pongsomlee,
Ph.D.(Human Ecology)
Dean
Faculty of Environment and
Resource Studies
Mahidol University

ACKNOWLEDGEMENT

The success of this thesis can be attributed to Asst. Prof. Sittipong Dilokwanich, my major-advisor, for extensive support and his time for correcting my thesis. I am grateful to Assoc.Prof. Saowapa Pornsiripongse for valuable suggestions. I especially appreciate Dr. Thawilwadee Bureekul for her kindness and helpful discussions. And I am grateful to Dr. Julaporn Euarukskul for her sincere help and suggestion. I would like to express my deep appreciation and sincere gratitude to them for their valuable advice and guidance in this research.

I wish to thank Khun Min Thongbai, the Deputy of the TAO, for his kindness in giving me a data about Tambon Bangpla and I also wish to thank all members of the TAO, head of village, and all key informants for their corporation. My special thanks are given to p'Roj, p'Tualek, p'Bew, Khun Porn tip, Khun Nan, and Bangpla's local people for their kindness and assistance.

I am grateful to all the lecturers and staff of the Faculty of Environment and Resource Studies for their support. And I would like to thank ADB and King Prajadhipok's Institute who are the scholarship grantors of this thesis.

My special thanks are contributed to my ET'27 friends especially p' Leng, p' Tae, Bank, King, p'Yak, Wan and Auem for their encouragement and help. My thanks are also given to my AT'15 friends, Jeab, p' Duan, p' Aeung, Moo, Jumjim especially Aoi and Aoo; my good friends for their help and my RD'6 friends especially Tak for her encouragement. Many thanks for Noi my lovely friend and I also want to thank my old friends for giving me motivation.

Most of all, I deeply appreciated my beloved family for their love and support. I really could not achieve the graduation without them.

Maliwan Nilrat

GOOD GOVERNANCE OF TAMBON ADMINISTRATIVE ORGANIZATION IN RESOURCE MANAGEMENT, TAMBON BANGPLA, AMPHOE BANGLEN, NAKHONPATHOM

MALIWAN NILRAT 4337280 ENTM/M

M.Sc. (TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT)

THESIS ADVISORS: SITTIPONG DILOKWANICH, Ph.D. (HUMAN GEOGRAPHY), SAOWAPA PORNSIRIPONGSE, M.A. (SOCIOLOGY AND ANTHROPOLOGY), THAWILWADEE BUREEKUL, Ph.D. (DEVELOPMENT ADMINISTRATION PUBLIC POLICY)

ABSTRACT

The new constitution mandates decentralization to local government. When environmental problems occur, it is the duty of Tambon Administrative Organization (TAO) to solve such problems. The researcher believes that a good governance concept can manage environmental problems in accordance with the local needs. The objectives of research were 1) To study environmental problems of Tambon Bangpla; 2) To investigate good governance of Tambon Bangpla Administrative Organization in environmental management; 3) To develop indicators of good governance in environmental management; 4) To propose a guideline for environmental management.

This research used both quantitative and qualitative approaches. The quantitative approach was used to examine existing environmental condition in the studied area by analyzing water and soil quality. Qualitative approaches, in-depth interview, focus group discussion, non-participant observation and stakeholder brainstorming were used to examine good governance in resource management of the TAO and study guidelines in local resource management.

The results showed that the water quality in many stations in the studied area were over the standard limit. The salinity of ground water was none, but it was not suitable for drinking because fluoride exceeded the standard limit. Soil salinity was moderate to strong which could affect some plants. Under a baseline design of indicators reflecting good governance on environmental management and evaluation on the Tambon Administration, it was found that the current collective indicator had covered the six principles of good governance (rule of law, integrity, transparency, public participation, accountability, and value for money) according to the Office of the Prime Minister (former regulation which is now cancelled, replacing by the Royal Thai Decree B.E. 2546 on restriction and good governance). At present, the TAO has not yet thoroughly applied indicators of good governance in environmental management. Political culture in Thailand especially the patronage system has become a major obstacle to good governance development. On rule of law principle, it focuses on equality of enforcement, whilst patronage system reflects the advantages of using its privileges. Therefore, the following guidelines are recommended: 1) appropriate management planning and budget allocation on environment with public participation; 2) applying a holistic approach in environmental problem solving; 3) reduction of agricultural chemical substances used by changing to organic agriculture; and 4) natural resource restoration of soil and water with its improvement and resting periods and conserving water resources by avoiding the causes of water pollution.

KEY WORDS: GOOD GOVERNANCE/ TAMBON ADMINISTRATIVE ORGANIZATION/
ENVIRONMENTAL MANAGEMENT

95 P. ISBN 974-04-5611-1

**ธรรมาภิบาลกับการจัดการทรัพยากรขององค์การบริหารส่วนตำบลบางปลา อำเภอบางเลน จังหวัดนครปฐม
(GOOD GOVERNANCE OF TAMBON ADMINISTRATIVE ORGANIZATION IN RESOURCE
MANAGEMENT, TAMBON BANGPLA, AMPHOE BANGLEN, NAKHONPATHOM)**

มลิวัลย์ นิลรัตน์ 4337280 ENTM/M

วท.ม. (เทคโนโลยีการบริหารสิ่งแวดล้อม)

คณะกรรมการควบคุมวิทยานิพนธ์: สิทธิพงษ์ คิลกวณิช, Ph.D. (Human Geography), เสาวภา พรสิริพงษ์,
M.A. (Sociology and Anthropology), ถวิลาดี นูรีกุล, Ph.D. (Development Administration Public Policy)

บทคัดย่อ

รัฐธรรมนูญฉบับใหม่มีเจตนารมณ์ที่จะกระจายอำนาจให้แก่องค์กรปกครองส่วนท้องถิ่น ดังนั้นเมื่อเกิดปัญหาสิ่งแวดล้อมในท้องถิ่น องค์การบริหารส่วนตำบลจึงเป็นหน่วยงานที่มีหน้าที่ในการแก้ไขปัญหาดังกล่าว และความเชื่อที่ว่าหลักธรรมาภิบาลจะช่วยส่งเสริมให้ อบต. จัดการสิ่งแวดล้อมได้สอดคล้องกับความต้องการของประชาชน การศึกษาครั้งนี้จึงเกิดขึ้น โดยมีวัตถุประสงค์เพื่อ 1) ศึกษาปัญหาสิ่งแวดล้อมของตำบลบางปลา 2) ศึกษาการใช้หลักธรรมาภิบาลในการจัดการสิ่งแวดล้อมขององค์การบริหารส่วนตำบลบางปลา 3) จัดทำตัวชี้วัดหลักธรรมาภิบาลในการจัดการสิ่งแวดล้อมของ อบต. 4) หาแนวทางการบริหารจัดการสิ่งแวดล้อมให้มีการบริหารจัดการที่ดี

การศึกษานี้ใช้วิธีการศึกษาทั้งเชิงปริมาณและคุณภาพ การศึกษาสภาพปัจจุบันของการจัดการทรัพยากรในพื้นที่ที่ศึกษาจะใช้การศึกษาเชิงปริมาณโดยการวิเคราะห์คุณภาพน้ำและดิน ส่วนการศึกษาเชิงคุณภาพ ได้แก่ การสัมภาษณ์เชิงลึก, การสัมภาษณ์แบบกลุ่ม, การสังเกตแบบไม่มีส่วนร่วม และการจัดประชุมผู้มีส่วนเกี่ยวข้อง จะใช้ในการศึกษาธรรมาภิบาลกับการจัดการทรัพยากรของ อบต. บางปลา และการหาแนวทางการจัดการทรัพยากรท้องถิ่น

ผลการศึกษาจากการวิเคราะห์คุณภาพสิ่งแวดล้อม พบว่า คุณภาพน้ำเกินมาตรฐานคุณภาพสิ่งแวดล้อมในหลายจุดที่ทำการตรวจวัด ส่วนน้ำบาดาล ความเต็มมีค่าปกติของน้ำจืด คือ 0 ส่วนในพันส่วน แต่มีค่าฟลูออไรด์สูงเกินมาตรฐาน ไม่ควรนำมาบริโภค ส่วนผลการวิเคราะห์ดิน พบว่า ดินบริเวณใกล้เคียงบ่อกักเก็บน้ำมีความเต็มในระดับปานกลางถึงเต็มมาก ซึ่งมีผลต่อการเจริญเติบโตของพืชบางชนิด จากการสร้างตัวชี้วัดธรรมาภิบาลในการจัดการสิ่งแวดล้อม และการประเมินการบริหารงานของ อบต. ในปัจจุบันพบว่า ตัวชี้วัดที่ได้ มีสาระครอบคลุมทั้ง 6 หลัก ของธรรมาภิบาล(นิติธรรม, คุณธรรม, ความโปร่งใส, การมีส่วนร่วม, ความรับผิดชอบ และความคุ้มค่า) ที่ประกาศโดยสำนักนายกรัฐมนตรี (ปัจจุบันยกเลิกแล้ว ใช้พระราชกฤษฎีกาว่าด้วยหลักเกณฑ์และวิธีการบริหารกิจการบ้านเมืองที่ดี พ.ศ.2546 แทน) ซึ่งในปัจจุบันผลการปฏิบัติงานของ อบต. ยังไม่ครอบคลุมตัวชี้วัดมากนัก วัฒนธรรมไทยในเรื่องระบบอุปถัมภ์ เป็นอุปสรรคต่อการพัฒนาไปสู่การมีธรรมาภิบาลอย่างแท้จริง โดยเฉพาะในด้านหลักนิติธรรมที่ต้องบังคับใช้กฎหมายอย่างเท่าเทียมเสมอภาคกัน แต่ระบบอุปถัมภ์จะนำไปสู่การใช้สิทธิพิเศษ ส่วนแนวทางในการจัดการสิ่งแวดล้อมนั้น มีการนำเสนอแนวทางในการจัดการเป็น 4 ประเด็น คือ 1) มีการวางแผนการจัดการและจัดสรรงบประมาณในด้านสิ่งแวดล้อม โดยให้ประชาชนมีส่วนร่วมในการเสนอความต้องการ 2) การจัดการปัญหาอย่างเป็นองค์รวม และการเสริมสร้างองค์ความรู้เกี่ยวกับสิ่งแวดล้อม 3) ลดการใช้สารเคมีในการทำเกษตรกรรม หันมาทำเกษตรอินทรีย์ 4) การฟื้นฟูทรัพยากรดินและน้ำ โดยมีการปรับปรุงดิน พักดิน และไม่ก่อให้เกิดมลภาวะต่อแหล่งน้ำ

CONTENTS

	Page
ACKNOWLEDGEMENT	iii
ABSTRACT- ENGLISH	iv
ABSTRACT- THAI	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER	
I INTRODUCTION	
1.1 The significance of the study	1
1.2 Research questions	3
1.3 Objectives of the study	3
1.4 Scope of the study	3
1.5 Expected results	4
1.6 Definitions	5
II LITERATURE REVIEW	
2.1 Natural resource management	7
2.2 Decentralization in local resource management	17
2.3 Tambon Administration Organization (TAO)	20
2.4 Good governance principle	24
2.5 Conceptual framework	33
III RESEARCH METHODOLOGY	
3.1 Research procedure	35
3.2 Data collection	37
3.3 Data analysis	42

CONTENTS (Continued)

		Page
IV	NATURAL RESOURCE MANAGEMENT OF TAMBON BANGPLA	
	4.1 Socioeconomic of Tambon Bangpla	43
	4.2 Environmental quality	45
	4.3 Existing environmental management	52
	4.4 Environmental management discussion	53
V	GOOD GOVERNANCE INDICATORS ON ENVIRONMENTAL MANAGEMENT	
	5.1 Indicator significance	56
	5.2 Good governance indicators on environmental management	57
	5.3 Environmental management guidelines	68
VI	CONCLUSION, DISCUSSION, AND RECOMMENDATION	
	6.1 Conclusion	72
	6.2 Discussion	74
	6.3 Recommendation	76
	BIBLIOGRAPHY	78
	APPENDIX	82
	BIOGRAPHY	95

LIST OF TABLES

Table	Page
3-1 Parameters and analytical method of water samples	39
5-1 Comparison of the indicators on rule of law from the literature reviews and brainstorming in the field survey.	58
5-2 Comparison of the indicators on integrity from the literature reviews and brainstorming in the field survey.	59
5-3 Comparison of the indicators on transparency from the literature reviews and brainstorming in the field survey.	60
5-4 Comparison of the indicators on public participation from the literature reviews and brainstorming in the field survey.	61
5-5 Comparison of the indicators on accountability from the literature reviews and brainstorming in the field survey.	63
5-6 Comparison of the indicators on value for money from the literature reviews and brainstorming in the field survey.	64
5-7 The good governance indicators on environmental management from the study	66

LIST OF FIGURES

Figure	Page
2-1 Conceptual framework	34
3-1 Research procedure	36
3-2 The water, soil, and ground water sampling sites, Amphoe Banglen, Nakhonpathom province	38



CHAPTER I

INTRODUCTION

1.1 The Significance of the Study

The Constitution of the Kingdom of Thailand 1997 mandates power decentralization. It encourages public participation in local resource management by defining right and role in Sections 46, 56, 59, 69 for people; Section 79 for central government and Section 290 for local government (The Constitution of the Kingdom of Thailand, 1997). In addition, National Decentralization Act (1999) and the 9th Economic and Social Development Plan (2002–2006) have encouraged good governance as to eliminate corruption in all social sectors. Good governance, therefore, is a sound management with transparency, accountability as well as people participation which is a solid base for Thai democracy.

Amphoe Banglen has 2 forms of local government consisting of 15 Tambon Administrative Organizations and 4 Tambon Municipalities (Banglen District Administration Office, 2001). The local government in this study is Tambon Bangpla Administrative Organization. Since this area was very fertile but now it has been deteriorated by misusing land. Shrimp farming, for example, wants saline water to feed giant tiger prawn (*Penaeus monodon*) causing a conflict with rice farmers who want freshwater. This conflict can be found in every area of Tambon Bangpla so that holistic approach and the way of Sufficiency Economy could probably solve and handle such problem (Silapakorn University, 2003).

Tambon Bangpla, Amphoe Banglen plays an important role in advanced agriculture to produce agricultural products for the world market. But the problem of economic development, for instance, affects the property right, soil and water resources deterioration and waste water from factories. These problems have affected local people in using Tha Chin basin for production. However, advanced agriculture requires more chemicals, fertilizers, pesticides and machines. These requirements not only invest high capital but also deteriorate soil and water ecology. In case of unstable production price in each year, farmers lose their money and have to sell their land. As a result, they become labourers in factory or look for a job in Bangkok causing rapid urbanization. In the future trend of these changes will be more rapid and serious. The critic of Tha Chin similarly to April 2000 may happen again but it will be more serious. So problem identification, prevention, and solving by community participation will be suitable and sustainable.

As mentioned, there has been problems of natural resource management in local level. Tambon Administrative Organization (TAO) is an important institution which has authority in this matter. The TAO of Bangpla, a case study, probably has potential to develop good governance in resource management as it got a high score of the first King Prajadhipok Award in transparency and civilian participation which were crucial elements of good governance (King Prajadhipok's Institute, 2001). Moreover, there are well cooperate from stakeholders in this study. However, it is questionable that how do they manage local resources and do they employ good governance in resource management? Since good governance is a tool of check and balance in environmental management, it has a proper punishment in order to control stakeholders' behavior in such management (Good governance for Social Development and the Environmental Institute, 2000). This tool will encourage the TAO to manage resources in harmony with local people's need. Therefore, good governance will raise a better Thai economy and society in sustainable way because everybody has good access to resources which will lessen conflict of uses but it will strengthen local organization in resource management (Uwanno, 1999).

1.2 Research Questions

1. What were the environmental problems in Tambon Bangpla?
2. How did the TAO manage environmental problems?

1.3 Objectives

1. To study environmental problems of Tambon Bangpla.
2. To investigate good governance of Tambon Bangpla Administrative Organization in environmental management.
3. To develop indicators of good governance in environmental management.
4. To propose a guideline for environmental management.

1.4 Scope of the study

The scope in this study covers:

1. Study area

This study took place at Tambon Bangpla, Amphoe Banglen, Nakhonpathom province. Its size is about 18,183 rai comprising 15 villages. This area is a flood plain in Tha Chin basin where the main river flows through in the northeast and divided this area into two parts. The major area is located at the west bank of Tha Chin river.

2. Target groups

In this study, there are stakeholders who are from 3 different groups:

- 1) Government or public sector:
 - Central government (Fishery Department and Department of Land Development)

- Provincial government (Nakhonpathom Provincial Administration Office, Nakhonpathom Provincial Agricultural Office, Nakhonpathom Provincial Fishery Office, Banglen District Fishery Office, Banglen District Agricultural Officer, Nakhonpathom Provincial Water Works Authority, Tambon Bangpla Water Works Authority, Nakhonpathom Provincial Public Health Office, and Tambon Bangpla Public Health Office)

- Local government (Tambon Bangpla Administrative Organization)

2) Private sector (entrepreneurs who are involved in agriculture, trading and industry)

3) Local people including farmers in Tambon Bangpla, Public Health Volunteers and Tha Chin Conservation Group.

3. Context and time

Environmental problems of Tambon Bangpla cover only soil and water quality. The TAO's role in local resource management is focused on good governance which cover 6 principles namely rule of law, integrity, transparency, public participation, accountability, and value for money.

The scope of time starts from the TAO has been set up since 1997.

1.5 Expected Outcomes

1. Existing condition in resource management of Tambon Bangpla.
2. TAO's roles in local resource management.
3. Recommended guidelines for local resources management of Tambon Bangpla Administrative Organization by using good governance.

1.6 Definitions

Good governance refers to administrative principle for work which is believed that it will bring in the best outputs. Following the Prime Minister's regulation on good governance 1999, the six key elements of good governance are: 1) rule of law; 2) integrity; 3) transparency; 4) public participation; 5) accountability; 6) value for money. The details of each element are as follow:

1) **Rule of law** covers fair legal frameworks that are enforced impartially. Impartially enforcement of laws requires an independent judiciary and an impartial and incorruptible police force. It also requires full protection of human right, particularly those of minorities.

2) **Integrity** means believing in a good thing and promoting human resource development. Expectingly Thai people will be as honest, hard working, patient and disciplinarian person.

3) **Transparency** means decisions making and their enforcement are done in a manner that follows the rules and regulations. It also means that information is freely available and directly accessible to those who will be affected by such decisions and their enforcement. In addition, it means that enough information is provided in understandable forms and media.

4) **Public participation** means all men and women should have a voice in decision making, either directly or through legitimate intermediate institutions that represent their interests. Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively.

5) **Accountability** means decision makers are accountable to the public and enthusiastic to solve the problems, to encourage free expression of opinion as well as response to their manner.

6) **Value for money** means processes and productive results of institutions that meet the needs of society by best using of limited resource. The concept of efficiency in the content of good governance also covers the sustainable use of natural resources.

Stakeholders mean any group of people, organised or unorganised, who share a common interest or stake in a particular issue or system; they can be at any level or position in society (Grimble and Wellard, 1996). Stakeholder in this study comprise public sector (government agencies), private sector (entrepreneurs), and local people.



CHAPTER II

LITERATURE REVIEW

Literature review of reports, research papers and other related documents was used for baseline data in order to confirm the data collected from the field. In addition, these data helped to draw a better conceptual framework. Therefore, the literature review were shown as follow:

- 2.1 Natural resource management
- 2.2 Decentralization in local resource management
- 2.3 Tambon Administrative Organization (TAO)
- 2.4 Good governance principle
- 2.5 Conceptual framework

2.1 Natural resource management

In this sub-heading can be presented in 4 aspects:

- 2.1.1 The meaning of natural resource management
- 2.1.2 Natural resource management approach
- 2.1.3 Local resource management
- 2.1.4 Environmental quality standard

2.1.1 The meaning of natural resource management

Antoniou (cited inThongsungwon, 1997) indicated that natural resource management means the method to prevent natural resource from destruction.

According to Chunkao (cited in Thongsungwon, 1997) showed that natural resource management means a process that has a dimension in utilization, treatment and control natural resource for sustainable use.

From the above meaning, natural resource management means human activity related to nature by forming a process in using, preventing and reclaiming natural resource for sustainable use.

In this study the researcher views natural resource management as process in using, preventing, improving and recovering natural resource by stakeholders who are from public sector, private sector and local people. The objective of such management aimed to conserve natural resource for sustainable use by setting a plan, project and organization and managing a financial support.

The natural resource management in this study covers:

1. Soil resource management comprises conservation of soil fertility and recovery of deteriorated soil;
2. Water resource management is consisted of the improvement and the recover of water quality.

The goals of these managements aim at serving people basic needs, providing raw materials for production process and supporting economic demand.

2.1.2 Natural resource management approach

Chunkao and Koysombun (1982) proposed main points of natural resource management:

- 1) To properly manage environment and natural resources which will bring in a sustainable yield in order to support human basic needs and life safety;
- 2) Sustainable yield of environment and natural resources will bring in the increment of ecological stock;

3) Proper management of environment and natural resources will include implementation guidelines of waste control because if there is no waste control, it will lessen ecological stock which will further threaten human production capacity;

4) The principle of conservation is used as the baseline of natural resource management. Hence the management processes shall be consisted of preserving, conserving, improving, repairing and developing resources. It is expected that these processes would lead to sustainable use;

5) Environmental management requires the processes of resource using, waste eliminating, stock incrementing and repairing. Moreover, natural standard of diversity, quantity and proportion of ecological element should be met which is an optimal point for living thing to enhance its productivity and to protect the upcoming pollution;

6) Natural resource management is aimed for better quality of human life and environment. The related factors of quality of life which should be considered are social and economic status, education, race, geography and existing environmental condition.

Tanthawirun and Samutsakhon (1985) proposed a holistic approach in natural resource management without separating human from the environment. Cultural and social dimensions are self-combined with resource use. Hence in term of resource management the relationship amongst resources within the community is supposed to be scrutinized.

Owing to strong relation amid those resources, holistic approach should be applied in natural resource management. Other related factors are also involved in management such as economy, society, politics, geography, and etc. These factors directly affect managerial style over each designated area. However, this principle is so abstract that problems might be created during manipulation of all resources.

2.1.3 Local resource management

In this study, local resource management is emphasized in soil and water resource which play significant role in community's way of life. Community based resource management and Banglen's natural resource are presented in this topic.

2.1.3.1 Community Based Resource Management

Common properties is crucial to be meticulously considered for resource management as it is a collective goods which was called "Community Resource". Share investment in community shall be taken in term of non-capital. Indigenous people must be well aware of any unallowable use of public land and hastily help make solution by any means such as commitment or rules created from participating basis. The principles for Community Based Resource Management: CBRM can be shown as follow (Thongsungwon, 1997):

- 1) The main objective of CBRM is to enable local people to manage resource system themselves because they are well aware of its problem and potential. This managerial concept should take into account sustainability of ecosystem as well as society, culture and economic of community;

- 2) The sustainable CBRM factors are consisted of (Phroma, 1998):

- 2.1) Continuous development or management that serves requirement and quality of life of local people. In each community there should be organization and process control and monitor apart from tradition or rule. An organization will play role of controlling and monitoring according to social commitment with either old style such as the head of village or new style with selected representative to form a committee;

- 2.2) Structure and organizations of community should be taken into consideration in community changing. Community will manage environment in a traditional way by themselves. They believe in super natural and other resource management tradition such as spirit worship in forest and in water. Under pressure from social changing, a new form of natural resource management was created. The

old style traditional was adapted to be social norm and regulation under community's commitment and awareness of the future for new generation;

2.3) The management was prescribed by the ecological limit. The community naturally conserves biological diversity in order to maintain ecological balance. Also the community has knowledge of ecology and holistic management approach including land use classification i.e. residential, farming and forest areas in order to proper utility and potential of their resources;

2.4) Appropriate technology is to be applied in community's production as well as improving and changing standard of living in relation to saving consumption style.

3) The operational strategies:

3.1) Operation to be undertaken by community themselves by means of placing importance on local area, understanding resource system and the relationship in community. Moreover community should be conscious of the objective of problem analysis and should apply problem analysis by using holistic approach which is covered the entire scales of community for instance individual, family, organization, community and basin. Afterwards, inventory of resource in place must be explored and collected for finding ecological capacity and local wisdom;

3.2) In the long term, community should apply the concept of community center to activate collective action and disseminate benefit to all sectors;

3.3) Decentralization should be done for creating decision making system in community level which will lead to autonomous control while still being regulated under the local culture or community's norm;

3.4) Opportunities in resource management should be fairly provided to each community, perhaps in form of pilot project so that learning by doing will be accomplished.

Community-based resource management can be successful when member of community together participate within ecological confine by applying appropriate technology for community production. Local resource management conducted by its community will lead to a sustainable management owing to their

mindfulness of problems and their own potentials. Besides, the proximity between their way of life and local resource will create conservative mind and eventually sustainable use of natural resource.

Obviously community-based resource management comprises ecological knowledge which leads to conservation planning and resource use which is controlled and investigated by local people. Community-based resource management is expected to create sustainability since only government power is inadequate.

Concepts of natural resource management is likely emphasized on outputs, e.g. quality of life, sustainable resource use, pollution prevention rather than inputs such as planning, management process, human resource, budget, etc. However, there is no specific person who is responsible in any duty. Moreover, most of resource management document showed separated management such as soil, forest, water management. As a matter of fact, all resources are related together. Hence the holistic approach should be applied to investigate the equilibrium of resource use.

Therefore, in natural resource management holistic approach and community-based resource management should be used.

2.1.3.2 Resources of Amphoe Banglen

Water and soil resources are the most important resources in Amphoe Banglen as there are many watercourses for instance Tha Chin river, Narapimul canal, Bangpasee canal and Klong Nokgratung canal (Amphoe Banglen Office, 2002). Amphoe Banglen was a flood plain area with fertile clay soil suitable for agriculture. Therefore, it has more paddy field than any other places in Nakhonpathom province. However, some area of Amphoe Banglen faced a problem of moderate acid soil because soil series of Sena composed of sea sediment. This problem would be intensified during dry season. Soil recovery by dolomite can solve acid soil.

Apart from deficiency of water during dry season, water pollution caused by livestock and industry was another effect in agricultural activities.

Moreover, there was a problem in water distribution because of changes in land utilization (e.g. from rice paddy to shrimp farm). The irrigation canal was originally designed for supporting only agricultural demand. When there were more shrimp or fish farms, there were higher quantity of water requirement at all time causing water shortage as well as water conflict between paddy and shrimp farmers. In addition, state's policy to promote industrial development in agricultural area caused conflict in water supply between agricultural and industrial sectors. The industrial system which was early established without waste water treatment plant caused serious problem to agricultural areas such as orchard, paddy field and water consumption.

Salinity from shrimp farm has affected paddy field and caused conflicts among farmers which would become serious in the future. (Pornsiripongse and team, 2002). The research conducted by Wiangwang and Kansangwon (1998) on salinity distribution and sulfur deposit from giant tiger prawn (*Penaeus monodon*) farming in Amphoe Banglen, Nakhonpathom province indicated that 70 percent of soil samples which was collected at the distance far from shrimp farm of 50, 100 and 150 m respectively hold higher salinity in rainy season than dry season. Likewise, in sulfur, 60 percent of soil samples hold higher value in rainy season. Propensity to increase in salinity and sulfur in soil directly vary along direction of surface water flow.

Tambon Bangpla in Amphoe Banglen, Nakhonpathom province is 8 kilometers far from Amphoe Banglen to the south which covers 29.09 square kilometers. The environmental problems of Tambon Bangpla were drawn as follow:

1) Water problems

There are many canals in Tambon Bangpla such as Thasan Bangpla canal, Rang Nangko canal, Bang Hwai canal and irrigation canal which used for agricultural and household consumption. The major surface water problems are presented as below:

A. Waste water

Water drained from many activities such as community settlement, livestock and aquaculture along river and canals caused waste water problem in this area. Moreover, there were toxic substances in the canals which were discharged from factory and agricultural activities. The concentration of toxic substances were high in dry season.

B. Water shortage

In dry season, water level of Thachin river was lower than the canals which affected higher terrain of agricultural area in the east bank, especially in Moo 2, 4, and 6. Meanwhile, the west bank of Thachin river faced a problem of water hyacinth which obstructed water flow and blocked sediment causing shallow river.

C. Lack of clean water for consumption

There are 23 ground water wells in Tambon Bangpla which are not suitable for drinking (fluoride is over the standard limit). Most people prefer to consume rainy water. Therefore, there should be enough water tanks for communities to store rain water (Silapakorn University, 2003).

2) *Air pollution*

Dust and smoke emitted from rice mills and factories. There were 2 rice-mills: Kitphrasoert and Thaithananukit and 2 factories-Deestone International LTD and orange juice manufacturing in the area. They were categorized in groups 1 and 3 according to Section 7 of the Factory Acts (B.E. 2535)¹ as the cases may be taken into consideration the necessity to control and prevention of damage and the protection of danger according to the strong level of effect to the population or the environment. However, industrial firms in Tambon Bangpla had not caused any serious problem (Silapakorn University, 2003).

¹ Group 1 factory : consisting of type and size that can start work immediately in accordance with the factory's owner. Group 3 factory: consisting of type and size that the construction of the factory must receive the permit before it can be proceeded.

3) Solid waste management problem

There was a problem of siting a land for solid waste disposal. Most domestic waste were eliminated by burning around their houses or by open dumping at area behind the TAO's office without good management. There is no proper sanitary landfill in TAO.

3) Odor problem from factories

The fish meal, alcohol and noodle factories caused odor, particularly in winter (November-January). The odor certainly irritated human respiratory system.

This research examined 2 natural resources-- water and soil which play a crucial role in ways of life of local people. Therefore, the water and soil resources problem would be solved for sustainable utilization. The existing condition of water and soil problems are classified as follows:

1. Waste water problem

This issue would be presented in 3 sources of waste water as shown below:

1.1 Domestic waste water

Waste water discharged from community via sewer to river had effected to water quality, particularly at Korat in Moo 10 where concentration of dissolved oxygen (DO) at 31 °C was only 1.4 mg/l which was lower than standard limit. Hence it was defined as waste water (good water quality should have DO value higher than 3.5 mg/l). In rural area, waste water problem was not so serious since people discharged it to the soil near their houses (Silapakorn University, 2003).

1.2 Agricultural waste water

- Waste water from rice paddy happened in rainy season when decayed straw were flooded. As a result, it caused waste water which was drained to river and canals.

- Waste water from shrimp farm discharged to water courses could endanger living organisms because they could not tolerate to the waste water.

- Waste water from livestock generated odor and algae bloom.

1.3 Industrial waste water

As mentioned, there were only two factories in Tambon Bangpla which caused very little waste.

2) Misuse of land

Misuse of land by inland shrimp farming deteriorated fertile soil of Tambon Bangpla which led to conflicts between shrimp and paddy farmers. This problem becomes more serious because waste water discharged from shrimp farm affected soil properties such as salinity and pH value. Consequently, the soil became not suitable for paddy field.

From the previous mentioned, Tambon Bangpla was an advanced agricultural area. However, the people's ways of life have been affected by urbanization from Bangkok bringing in deteriorated environment, industrial waste etc. Moreover, commercial agriculture exploited chemical substances, fertilizer, pesticide including modern agricultural tools. Using these technologies not only too more cost but also damaged the ecology whereas product price was too unstable. Then the farmers regularly became bankrupt. The crisis of Thachin river would recur and become far more serious (Silapakorn University, 2003).

2.1.4 Environmental Quality Standard

Surface water quality standard notified by the National Environmental Board issued under the Enhancement and Conservation of National Environmental Quality Act 1992 in Section 32 (1), the National Environmental Board classified surface water quality by its condition and beneficial usage into 5 classes. Thachin river in Amphoe Banglen has been classified in class 3 which is medium clean fresh water used for consumption, but passing through an ordinary treatment process before using, and used for agriculture.

In class 3, dissolved oxygen is equal to or more than 4 mg/l, BOD₅ is not beyond 2 mg/l, and total coliform bacteria is not more than 20,000 MPN/100 ml (National Environmental Board, 1994). While the Office of Environmental Policy and Planning (2001) indicated the water quality of Thachin river was in fourth class which was relatively used for industry; DO value ranged 1.0 – 3.6 mg/l and BOD₅ ranged 1.6 – 3.4 mg/l. Moreover, Thachin river was classified into class 4-5 when considering from total coliform bacteria (2,700 – 2,137,000 MPN/100 ml) which is used for industry and navigation. The causes of water quality problems in this area is risen from the activities along the river bank (e.g. domestic waste, pig farm and agricultural waste) particularly in high density community which deteriorated water quality (Department of Industrial Works and Environmental Engineering Association of Thailand, 2002).

Soil resource was a fundamental of ecology. The plant's growth rate depends on soil fertility² which related to physical, chemical and biological properties. The three factors should be suitable for plant so as to bring a good production. Therefore, soil fertility played an important role in agriculture. However, impacts from inland shrimp farming could change soil properties (e.g. salinity and pH) which is not suitable for paddy farming (Silapakorn University, 2003).

2.2 Decentralization in local resource management

The Constitution of the Kingdom of Thailand 1997 aimed at promoting decentralization of local governments. It was stipulated in Section 78 which reads “The State shall decentralize power to localities for the purpose of independence and self-determination of local affairs, develop local economics, public utilities and facilities systems and information infrastructure in the locality thoroughly and equally throughout the country as well as develop into a large-sized local government

² Soil fertility means ability to release a minerals to plant. It depends on type and quantity of the minerals in soil and environmental condition to control the minerals releasing (Khrutkun cited in Kosonsaksakun, 1997).

organization a province ready for such purpose, having regard to the will of the people in that province.”

Besides, the Constitution mandates for decentralization in resource management to the local governments as it stipulates in Section 290 which reads "For the purpose of promoting and maintaining the quality of the environment, a local government organization has power and duties as provided by law.

The law under paragraph one shall at least contain the following matters as its substance:

- (1) the management, preservation and exploitation of the natural resources and environment in the area of the locality;
- (2) the participation in the preservation of natural resources and environment outside the area of the locality only in the case where the living of the inhabitants in the area may be affected;
- (3) the participation in considering the initiation of any project or activity outside the area of the locality which may affect the quality of the environment, health or sanitary conditions of the inhabitant in the area.”

The main content of Section 290 is to create laws as to assure legal authority of locality in enhancement and conservation of environment. Also the law must assure the locality to be able to manage natural resources within their perimeter. Outside their perimeter, the local authorities can participate in resource management which will affect ways of life; and there is any new project or activity which will affect quality of life and the environment.

Although the Constitution has stipulated clear mandate for right, liberty and duty of people, community and state in environmental management, they are always supported in practice by other mandates related to environmental management, e.g. Sections 56, 58 and 59 of the Constitution of the Kingdom of Thailand 1997.

To put the Constitution into practice, there would be Act of 1999 which support the designs of Plans and Process for Decentralization from the state to the locality (hereinafter refers to as Decentralization Act) was enacted. It lays down the delineation of power and duties in the management of public services as well as the environmental management of local government organizations stated in Section 16 (24) and Section 17 (5) (12).

Practically, the Decentralization Act has transaction of power in local resource management to local authority which was divided into 3 part as follow:

- 1) Conservation of natural resources, the protection and maintenance of forest;
- 2) Environment and pollution management; and
- 3) Maintenance of public land.

The fundamental concepts for decentralization in natural resource management can be shown as follow (Chamrunphanitkun, 2001):

- 1) Sustainability and principle of sustainable development

The meaning of these two words usually interchange even though it has a different approach. Sustainable development means to place an importance to not only natural resource but also quality of life consisting of income, occupation, healthy, accommodation and etc. It covers more aspects not only developing economic but also promoting people participation in natural resource conservation for the next generation. On the other hand, sustainability simply playing an important role on natural resource more than other factors.

The difference between sustainable development and sustainability was a reflect of separation between political development and environment.

- 2) Power transfer of decision making to the most suitable level

It might be interpreted into 2 aspects which are institutional aspect and political aspect. Institutional aspect suggested that the power of decision making should be allocated to a grass-root. The political aspect suggested that sustainability is needed

for democratization. The concepts of democratization are consisted of many aspects for instance decentralization of control, people participation, empowerment and capability improvement.

A new concept of natural resource and environment comprise sustainability, democratization and equality which are crucial processes for sustainability of natural resource and environment.

2.3 Tambon Administrative Organizations

Natural resource management is depended upon a corporation of many stakeholders especially the Tambon Administrative Organization (TAO) which is a representative of local people. Therefore, it should pay a crucial role in local administration with its rights and duties as shown below:

2.3.1 Background of the TAO

Due to government policy in promoting decentralization to all sectors, Tambon Administrative Organizations have been set by promulgating Decentralization Act of 1994 with an aim to raise a status of the TAO to be a juristic person and enhance the decentralization of power to local administration.

2.3.2 The TAO's administrative structure

A Tambon Administrative Authority is composed of a Tambon Administrative Authority Council, Tambon Administrative Committee and Tambon Administrative Authority. The Tambon Administrative Authority Council is composed of members, two from each hamlet, elected by persons with the right to elect in each hamlet in the Tambon Administrative Authority's territory. Where the territory of any Tambon Administrative Authority has only one hamlet, the Tambon Administrative Authority Council is composed of six members, and where there are only two hamlets, it is composed of three members from each hamlets. The rules and procedures for candidacy and elections shall be in accordance with the law on elections for local councils or local administrators. The term of the Tambon Administrative Authority

Council is four years from the election day. The Tambon Administrative Authority Council were erected chairman and assistant chairman of council including head of administrative committee and assistant head to manage the TAO business (www.kodmhai.com, 26 January 2004).

2.3.3 Power and duties of the Tambon Administrative Authority Council and the Administrative Committee

2.3.3.1 The Tambon Administrative Authority Council has the following power and duties (<http://www.ipd.ph/logolinksea/resource/Tambon.pdf>, 26 January 2004):

- 1) Give approval to Tambon development plans so as to serve as a guide for administering the business of the Tambon Administrative Authority;
- 2) Consider and give approval to draft Tambon regulations, draft annual expenditure budget regulations and draft additional expenditure budget regulations; and
- 3) Control the performance of work by the Administrative Committee to be in accordance with the policies and Tambon development plans under (1) and the laws, Rules and Regulations of the service (Tambon Council and Tambon Administrative Authority Act B.E. 2537, Section 46).

2.3.3.2 The Administrative Committee has the following power and duties (<http://www.ipd.ph/logolinksea/resources/Tambon.pdf>, 26 January 2004):

- 1) Administer the business of Tambon Administrative Authority in accordance with the resolutions, regulations and Tambon development plans; and is responsible to Tambon Administrative Authority Council for the administration of for the business of Tambon Administrative Authority;
- 2) Prepare and make Tambon development plans and annual expenditure budgets for Tambon Administrative Authority Council to consider giving approval;
- 3) Report on the performance of work and use of money to the Tambon Administrative Authority Council at least twice a year; and

4) Perform other duties as entrusted by the service. (Tambon Council and Tambon Administrative Authority Act B.E. 2537, Section 59).

2.3.4 Power and duties of the Tambon Administrative Authority

1) The Tambon Administrative Authority has power and duties in the Tambon's economic, social and cultural development;

2) Subject to the law, it is the duty of the Tambon Authority to do the following in its territory (Tambon Council and Tambon Administrative Authority Act B.E. 2537, Section 67):

- (1) provide and maintain waterways and land routes;
- (2) keep the roads waterways, paths and public places clean, and also provide garbage and night soil services;
- (3) prevent and stop communicable diseases;
- (4) provide public disaster relief;
- (5) promote education, religion and culture;
- (6) promote the development of women and children, the youth, the elderly and the handicapped;
- (7) protect, look after and maintain natural resources and the environment;
- (8) perform other duties as entrusted by the service with a budget allocation or personnel when necessary and as appropriate.

Subject to the law, the Tambon Administrative Authority may do the following business in its territory:

- (1) provide water for consumption and agriculture;
- (2) provide and upkeep power or lighting in other ways;
- (3) provide and maintain drains;
- (4) provide and upkeep meeting places, sport, recreation and public park;
- (5) provide and promote farmer's groups and cooperative businesses;
- (6) promote family industries;

- (7) upkeep and promote occupations;
- (8) protect, look after and maintain property that is domaine public of State;
- (9) seek benefits from property belonging to the Tambon Administrative Authority;
- (10) provide markets, berths or docks for vessels and fording places;
- (11) business concerning commerce;
- (12) tourism; and
- (13) town and country planning.

4) The powers and duties of the Tambon Administrative Authority under Sections 66, 67 and 68 do not prejudice the power and duties of the Ministries, departments, or State organizations or agencies in doing any business for the benefit of the people in the Tambon. Provided they notify the Tambon Administrative Authority in advance as is reasonable. In such case, if the Tambon Administrative Authority has opinion on doing such business, the Ministry, department, or State organization or agency shall use such opinion (among others) to support its consideration for doing such business (Tambon Council and Tambon Administrative Authority Act B.E. 2537, Section 69).

Therefore, the TAO have the rights and duties in local resource management, as manifested by the Constitution of the Kingdom of Thailand 1997, which was supported budget by central and local government. For this reason, it is important to enhance an effectiveness of TAO in local resource management for sustainable use. But there are many impediments for TAO to complete its mission since it lack of qualified staff, database and concept for Tambon development planning. According to the research which was conducted by Local Development Department, Ministry of Interior (1998) about a five-year plan of the TAO, it was found that the TAO gave the first priority to infrastructure while the project on human development was put in the last. It was noted that other Tambon development plans lacked of people participation.

2.4 Good Governance Principle

2.4.1 The meaning and concepts of good governance

World Bank (1992) defined good governance as a way in which power is exercised in the management of the economic and social resources of a country, notably with a view to development.

UNDP (1997) views governance as the exercise of economic, political and administrative authority to manage a national affairs at all levels—sound and sustainable economic development, efficient government, effective civil society, successful private sector, democracy and participation, balance, equity, mobilization of resources and the rule of law. The UNDP sees the result of good governance as development that gives priority to poor, women, sustains the environment and creates needed opportunities for employment and other livelihoods.

Sam Agers (2002) views the good governance as people's participation, transparency and accountability which were guaranteed consensus on political, social and economic policies as to ensure that the voices of the poorest and most vulnerable are heard in the decision-making process regarding the allocation of resources. Good governance comprise five elements--accountability, transparency, counter corruption, people participation and strengthening legal framework and process.

The Office of the Prime minister's regulation on good governance B.E. 2542 defined good governance as a guideline for systematic public sector, private sector and civil society as to empower sustainable development and strengthening national affairs. It is expected that this principle will bring the equity, transparency and public participation which are in line with the Thai Constitution and contemporary situation of the world (Nimitkun, 2000 cited in Kingprajadhipok's Institute, 2001). Good governance's elements comprise rule of law, integrity, transparency, public participation, accountability and value for money.

King Prajadhipok's Institute (2002) considers good governance more than just an examination of the institution of public administration or the methods and instruments of relationships between government and citizens. It is more than an issue of public management but rather how the political system of a country can be adapted to help it resolve the problem it faces. Good governance principles are rule of law, integrity, transparency, public participation, accountability and effectiveness.

Sopchokchai, et al. (2000) view good governance as the relationship among three sectors--civil society, private sector and public sector. The more good governance, the more balance and stability in society.

From these varying perspectives, good governance should be seen as the principle to exercise economic and social resources for development. It is consisted of three sectors taking part in – civil society, private sector and public sector. This principle was believed that if in use it will bring the best outcome. The elements and details of good governance can be shown as follow:

- 1) Rule of law covers fair legal frameworks that are enforced impartially. Impartially enforcement of laws requires an independent judiciary and an impartial and incorruptible police force. It also requires full protection of human right, particularly those of minorities.

- 2) Integrity means believing in a good thing and promoting human resource development. Expectingly Thai people will be as honest, hard working, patient and disciplinarian person.

- 3) Transparency means decisions making and their enforcement are done in a manner that follows the rules and regulations. It also means that information is freely available and directly accessible to those who will be affected by such decisions and their enforcement. In addition, it means that enough information is provided in understandable forms and media.

4) Public participation means all men and women should have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their interests. Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively.

5) Accountability means decision makers are accountable to the public and enthusiastic to solve the problems, to encourage free expression of opinion as well as response to their manner.

6) Value for money means processes and productive results of institutions that meet the needs of society by best using of limited resource. The concept of efficiency in the content of good governance also covers the sustainable use of natural resources.

Good governance which was defined by the Office of the Prime Minister (former regulation which is now cancelled, replacing by the Royal Thai Decree B.E. 2546 on restriction and good governance of the year 2003)³ simply means good government. According to UNDP, good governance is a relationship between 3 sectors--government sectors, private sector and civil society. The point of views on good governance comprises 3 elements as followed:

1. State with high ability and strength;
2. Strong private sector and civil society which pay attention to public concerns;
3. The creative, equal and opened relationship among government sector, private sector and civil society.

From the above frameworks, local environmental governance needs cooperation of all stakeholders. To make it done, local government organization should do as follow:

³ The Royal Thai Decree B.E. 2546 pertaining to the principles and methods of the kingdom administration stated the missions and duties of the local administrative organization in Article 52 that concerning authorities heeded the principle of good governance.

1) Strengthening Local Government

Local government should take the principle of transparency and accountability into practice and concentrate on the outcomes of work rather than the processes or regulations. Moreover, decision-maker should have a vision in administration and honesty as it will bring trust and cooperation from other sectors.

2) Empowering Civil Society

Strengthening civil society is an important part of good governance. Even though local government give a chance to participate, it will be meaningless unless civil society take that chance.

3) Enhancement Public Participation

Public participation is one of the most important factors of good governance. Participation may be in form of proposing ideas, working and inspecting local government administration. It is expected that these processes will bring an equity and acceptance among stakeholders.

Since the Decentralization Acts transfers power and responsibilities in natural resource management to local government organizations, thus they should change the way of working for successfulness in local resource management by establishing sustainable community and local governance. It is hard to succeed if it lacks of a political will which is an important factor. This is a hard situation for the head of local government organizations to choose between sustainable community and victory in election (Chamrunphanitkun, 2001).

2.4.2 Factor affecting good governance

Political culture in Thailand does affect the good governance which has an impact on the management. This particular factor can promote or hinder the political participation of the people, and it consists of four components (Sukhothaithammathirat University, 1989).

2.4.2.1 Social Power Structure

2.4.2.2 Economic Power Structure

2.4.2.3 Political Power Structure

2.4.2.4 Journalism and Mass Media

2.4.2.1 Social Power Structure

As we are well aware, the Thai society is the one that based on the so called “individualism” blended with the hierarchical structure or the seniority system which recognizes powerful people. These two factors are the foundation of the Thai social structure which forms the political and social personality (Pongpaew and Jirkraisiri, 1991). This type of social pattern derives from human’s belief, value and attitude which is the result of individual learning process from political activities or political system.

Studies have indicated that most Thai people bear the following political culture traits (Sukhothaithammathirat University, 1989).

1. Power-based trait. Most Thai citizens have tendency to render absolute power. Thais are obedient and loyal to the one who holds power to rule. They submit power and all types of responsibilities to the lone leader.

2. Feudalism and Cronyism Trait. Most Thais prefer belonging to a social group. They hold that their leader is their boss who is supposed to possess considerable power to protect and provide interests to his/her cronies or subordinates. Meanwhile, the latter provides support and gives service to the former.

3. Individual-over-Principle Trait. This can be observed from any political election. Most Thai voters pay attention to the individual candidate’s character and qualification rather than the political party’s policy and stance.

4. Status Symbol Trait. This can be explained that most Thais prefer inter-individual relationship arrangement which brings about social inequality and make people stick to their inherited character, such as seniority and education level status.

5. **Independency.** They prefer independence and doing things independently without interference of other people. They do not like being enforced and tend not to be under rules or laws. This trait causes Thais to be indisciplined persons.

6. **Adherence to Traditions.** Thais stick to old-aged belief, value, attitude and traditions. They are superstitious and tend to leave their future to their horoscopes.

7. **Inertia.** They lack eagerness and enthusiasm, unlikely to pay attention to political activities and are ready to accept disadvantage for they hold that it is because of past generation deed.

8. **Lack of Self-Confidence.** They seem to be pessimism. This means that they do not trust their peers but vest their trust to the leader. However, the leader happens to be the one who most people do not respect.

9. **Peaceful Living and Compromising.** They avoid violence and conflicts. They are very humble and highly considerate, do not criticize people openly, unable to make decision when it is necessary to do so.

Judging from the above mentioned political characteristics, we may assume that Thai people are likely to prefer the way of life with superior, and it causes a hindrance to motivate them to take part in political activities.

2.4.2.2 Economic Power Structure.

It is considered that the country's economic status is one of the most important factors that has influence on people to participate in political activities. A country with an up-turn economy, peaceful situation and well-being citizens would help encourage people to have creative attitude towards politics and want to participate. They have potential to donate money to charity organizations. In the contrary, a nation with economic social crisis, people may be pressured to resort to protest the government.

2.4.2.3 Political Power Structure

Political condition has influence on people to take part in political movements. Political system also plays a vital role. We firmly believe that in a democracy country, people are able to encourage the mass freely. In a nation with dictatorship, people take to the street to propoganda the government. Meanwhile, in a country with a totallism, the government manipulates and controls all public organizations and masterminds all kinds of movements.

2.4.2.4 The Mass Media

The mass media is very influential in motivating political participation, especially in a group internal communication in order to make group members clearly understand the purposes and necessity to participate would enrich political system. External journalists who report positive and supportive news help make more people participate and create strong movements. If they do otherwise, would cause weak movements and may fail in the end.

2.4.3 Relevant researches

The relevant researches about good governance in local administration can be shown as follow:

1) Thailand Environment Institute, King Prajadhipok's Institute and NGO Coordinating Committee on Development (2002) reformulated the draft indicators developed by the World Resource Institute, an international environmental civil society organization, and applied them to Thai society, calling itself "The Access Initiative" seeks to promote public access to information participation and justice in environmental decision-making. Many case studies were used to test the indicators. The crucial conditions for public participation were public access to information, public access to decision-making and public access to justice.

The result showed that Thailand is moving towards a system of environmental governance that promotes public access to information, decision-making and the judicial process, but there are areas of concern.

Public access to information are questionable, the ease of access to information related to development projects. There are doubts over the government commitment to public participation and efforts to build the public's capacity for meaningful participation are lacking.

Public access to decision-making are also questionable. Although Thailand provides an explicit constitutional right to public participation in decision making. However, laws and regulations concerning environmental impact assessment lack provisions guaranteeing public notice and comment.

For Thailand, the channels for access to information, participation and justice are very narrow. Enforcement of the many related law and regulations is also questionable. Strengthening public participation is an important way to solve such problem.

2) King Prajadhipok's Institute (2001) made a documentary research about good governance indicators, the results show that:

Good governance is a concept that has lately come into focus in development and management. The concepts and terms are widely promoted by the International agencies such as the United Nations, World Bank, and ADB (Asian Development Bank). More importantly, good governance is closely associated now with the public sector reform in most developing countries. This study examined indicators and practices of good governance in Thailand, Philippines, Indonesia, and Botswana respectively.

The five key elements of good governance were discussed in this study. They are: 1) legitimacy; 2) transparency; 3) accountability; 4) efficiency and effectiveness; and 5) participation. The indicators of the five elements show how successful conducting in the fields of legislation, economics, social and politics. Thus, it is essential that the government must adopt these five elements in its own areas in order to put the good governance concept into practice.

3) The Office of the National Counter Corruption Commission, Office of the Civil Service Commission and Thailand Development Research Institute (2000) conducted a pilot project of good governance development in Tambon level. This research chose a case study at the TAO of Chompu Amphoe Sarapee, Chaingmai province. These area has a potential in economic, social and political factors which are suitable for developing good governance principles. The objectives of this study aimed at finding a suitable guideline to develop good governance in Tambon level and ensure the possibility and suitability of this principle. The framework of this study was set following the six elements of good governance in the Office of the Prime Minister's regulation on good governance which consisted of rule of law, public participation, transparency, value for money, accountability and integrity. It was a participatory research which cooperated with the TAO's members. The researcher acted as a facilitator who helped members of the TAO get better understanding in the context of these research and set research guideline. The solution how to apply good governance in administration under the TAO context were done by members of the TAO themselves. The researcher just played a role of data collector.

The results showed that only 4 elements of good governance were possibly applicable--rule of law, transparency, public participation and value for money. The rest, integrity and accountability, seemed too abstract and need promotion and enhancement for people's awareness.

4) King Prajadhipok's Institute (2001) ranking for local authorities that participated in the first King Prajadhipok Award in 2001. Entitled "Transparency and Civilian Participation", and Causal Relationships among Selected Variables and Civilian Confidence toward the Local Authority.

The major purpose of this study was threefolds: first, to rank the priority of the local authority that participated in the first King Prajadhipok Award; second, to study the civilian's point of views in terms of the local authority transparency, civilian participation, civilian confidence, civilian satisfaction in the local authority public services; third, to study the causal relationships among the

selected variables and civilian confidence toward the local authority. Data were gathered from two sources: 1) The local authority documents and 2) the civilian questionnaire. All completed data were analyzed by using the SPSS program.

Research results showed that there were 257 TAOs participating in the 1st King Prajadhipok Award. The TAO that passed criteria and got grade A were the TAO of Huy Krapu in Choburi province and Suan-mon in Khonkhan province. The TAO of Bangpla, Nakhonpathom province which is the case study was graded to B⁺ and also got the highest score when considering from the local authority documents. Apparently, the TAO of Bangpla is excellent in transparency and civilian participation which were crucial elements of good governance.

2.5 Conceptual Framework

Local resource management problems often relate to economic and political development which influence land use changes. In the past, majority of people grew rice paddy but now some of them change to aquaculture, particularly giant tiger prawn (*Penaeus monodon*) that has to be fed by saline water. So it affects to rice paddies near aquaculture and degraded a fertile land for agriculture. Moreover, agricultural, domestic and industrial waste water have affected ways of life of people because soil and water are the fundamental of production.

If we compare existing environmental condition in Tambon Bangpla with environmental standards, it would lead us to know status of environmental quality. Then the researcher examine stakeholders who are involved in local resource especially the TAO that plays a significant role in this matter as mandated in the Thai Constitution. Besides state policies promoted good governance as it was believed that it would bring a sound management. Therefore, the examination of the TAO performance by developing good governance indicators with public participation is needed. Good governance principle in this study comprise 6 elements—rule of law, integrity, transparency, public participation, accountability, and value for money.

Finally, the researcher propose the guidelines for local resource management considering from assessment outcome (Figure 2-1).

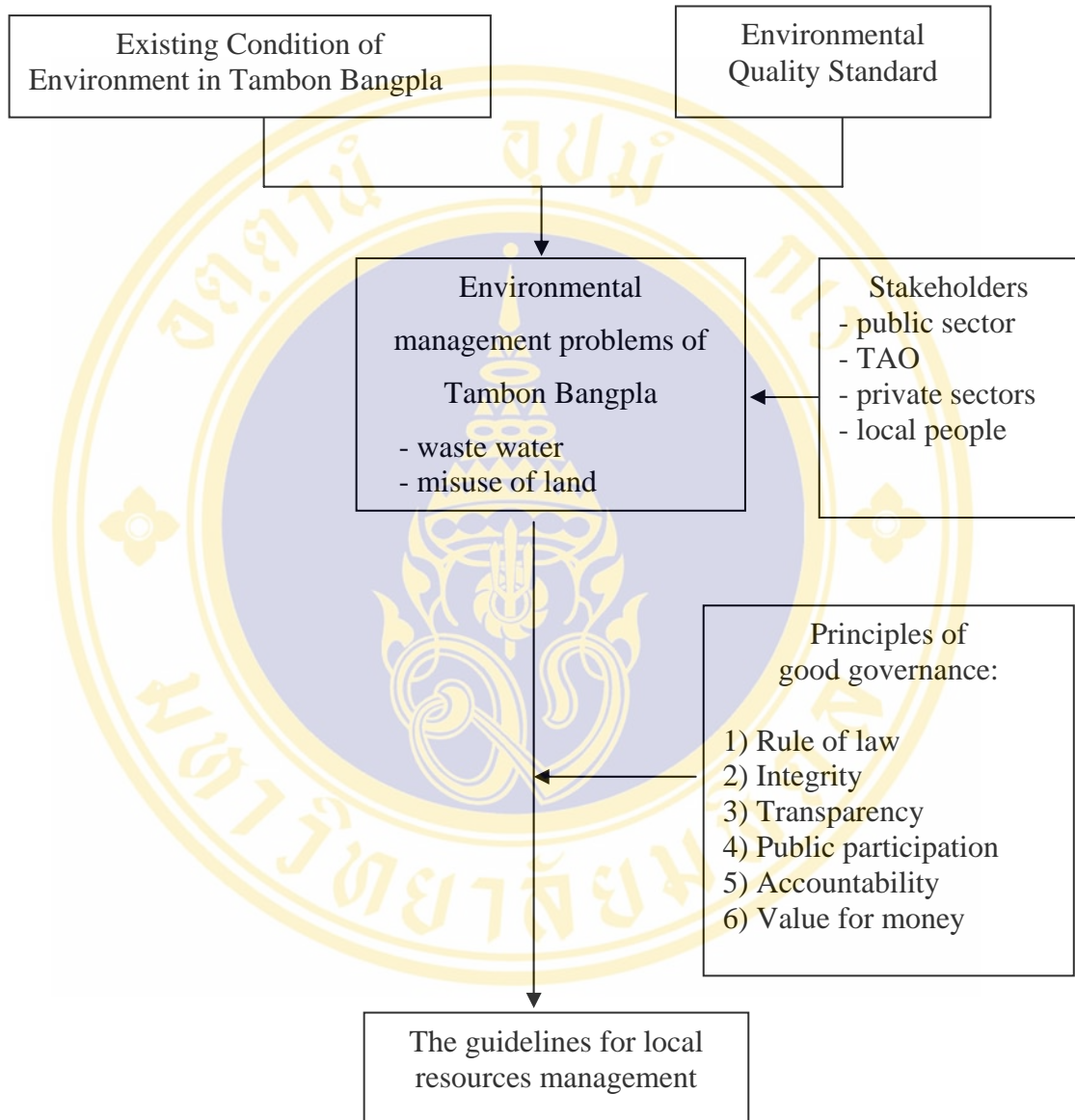


Figure 2-1 Conceptual framework

CHAPTER III

RESEARCH METHODOLOGY

This research used both quantitative and qualitative approaches as to examine indicators of good governance in local resource management of Tambon Administrative Organization (TAO) with a case study of Tambon Bangpla Administrative Organization, Amphoe Banglen, Nakhonpathom province. The research methodology can be shown as follow.

3.1 Research Procedure

The researcher reviewed documents concerning environmental management, surveyed the studied area and interviewed key informants such as community leaders and government officers. After that the local environmental management problem topics were set.

Then the researcher examined existing condition of environmental management in Tambon Bangpla and compared it with environmental quality standard in order to know the environmental situation of the studied area. In addition, the researcher reviewed laws and regulations concerning the rights and duties of local organization in resource management then identified the stakeholders by indepth interview.

Later, the researcher developed good governance indicators and criteria in environmental management by stakeholders brainstorming and verified it with reviewed indicators. These developed indicators would be used for assessment of the TAO's performance.

Finally, the researcher suggested solutions and guidelines for local resource management considering from assessment outcome and community’s context (Figure 3-1).

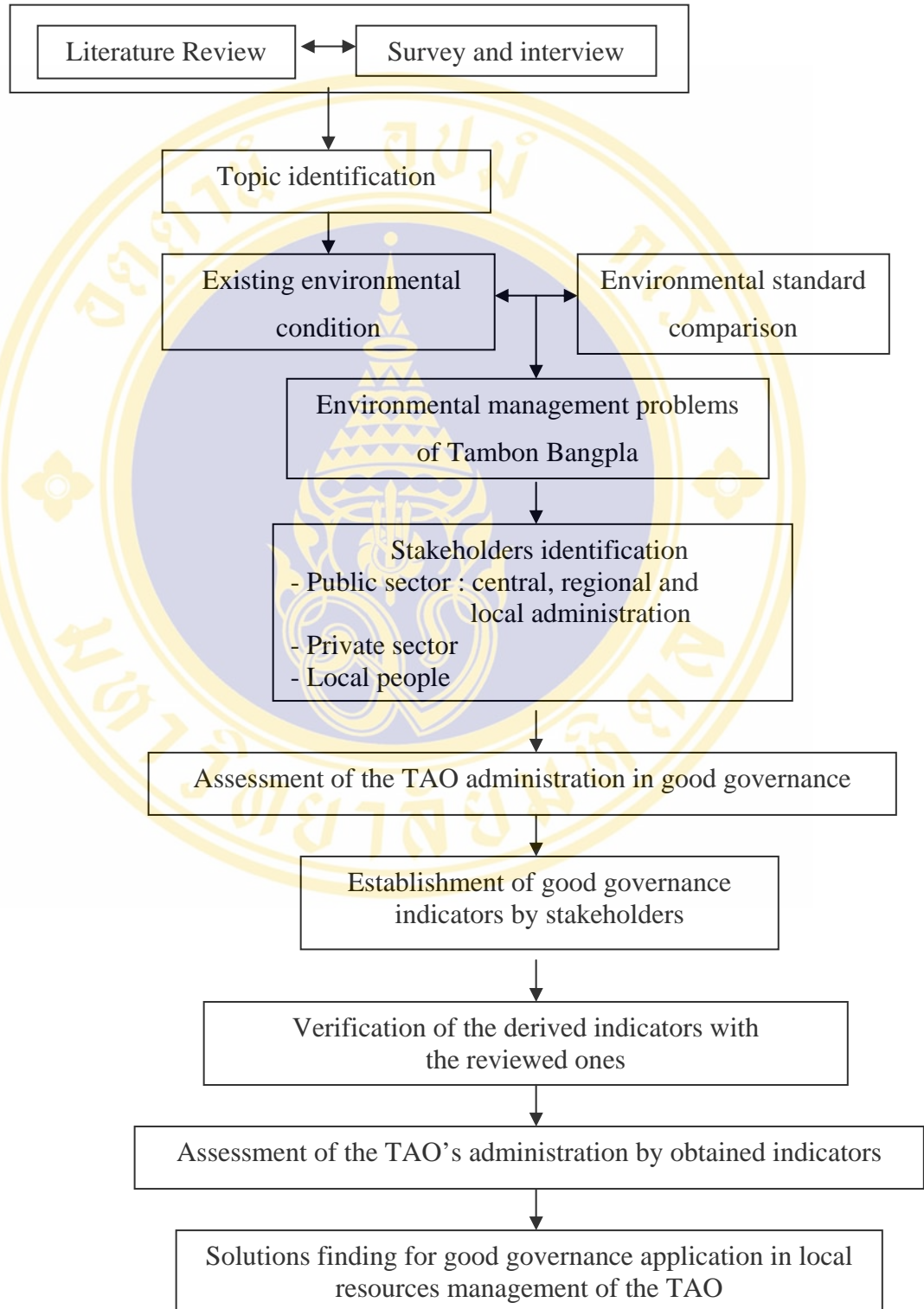


Figure 3-1 Research Procedure

3.2 Data collection

3.2.1 Secondary data collection

Secondary data on environmental management were derived from various sources. The data about policies, development plans and roles of officer were derived from public sectors which included Fishery Department, Department of Land Development, Nakhonpathom Provincial Administration Office, Nakhonpathom Provincial Agricultural Office, Nakhonpathom Provincial Fishery Office, Nakhonpathom Provincial Water Works Authority, Nakhonpathom Provincial Public Health Office, Banglen District Fishery Office, Banglen District Agricultural Office, Tambon Bangpla Public Health Office and the TAO of Bangpla.

Technical data related to this research were collected from documents, reports, text books, journals, articles and internet.

3.2.2 Primary data collection

1) Existing environmental management condition survey

The researcher surveyed environmental condition in Tambon Bangpla then soil and water samples were collected from various sites, and analyzed as follow:

a) Surface water measurement

In water sample collection, the researcher designed to collect 16 water samples at the beginning and the end of canals and Thachin river which flow through crowded communities and other major land use types (e.g. paddy field, shrimp farm, industry, etc.) in Amphoe Banglen (Figure 3-2). The researcher collected water samples in the middle point of width and depth of the running water.

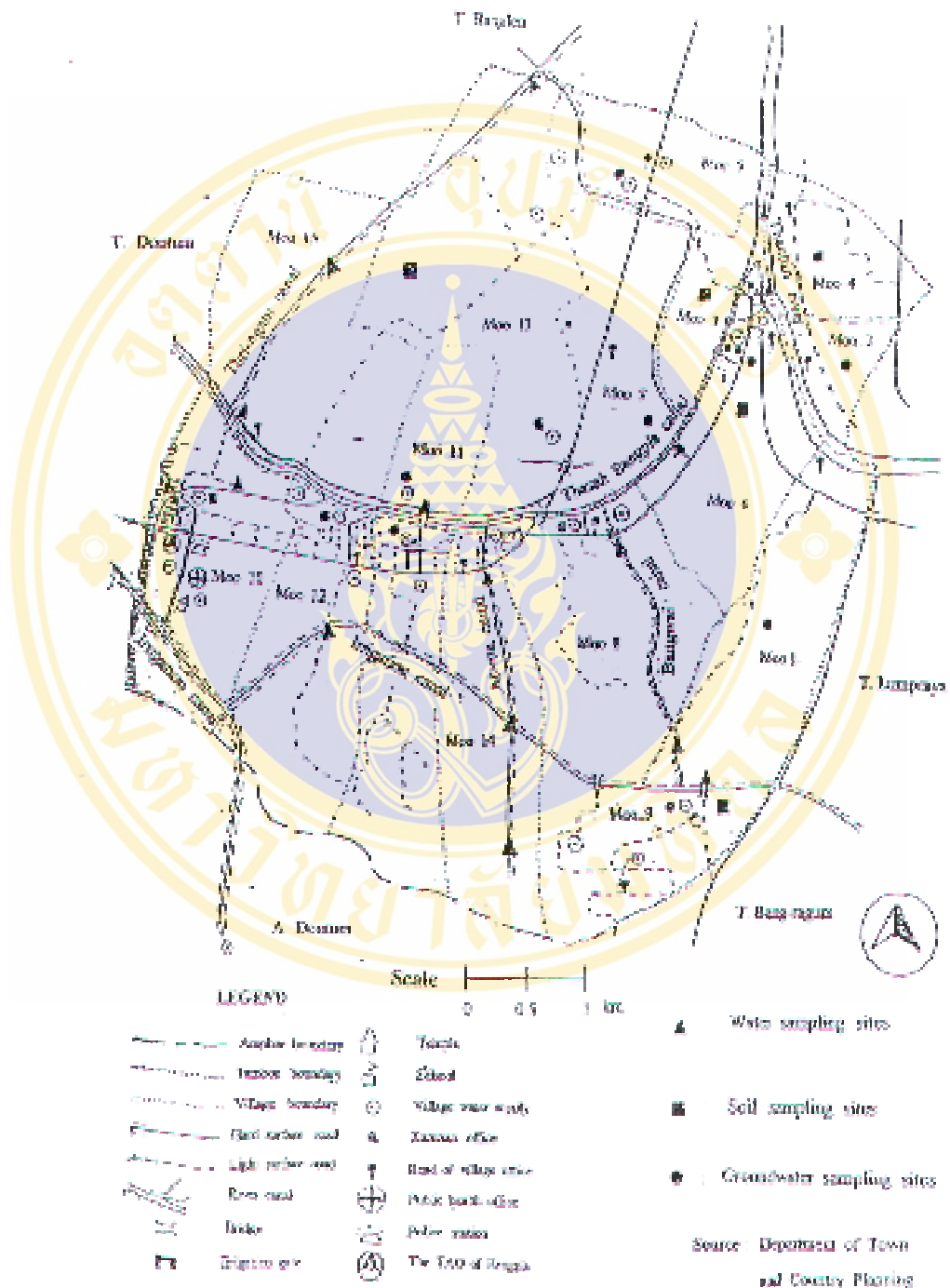


Figure 3-2 The water, soil and ground water sampling sites, Amphoe Banglen, Nakhonpathom province.

In each water sampling site, the researcher analyzed physical and chemical parameters in order to indicate water quality. For physical property, water parameters were transparency and temperature, while chemical property covered salinity, conductivity, pH, dissolved oxygen (DO), biochemical oxygen demand (BOD). Analytical methods for each parameter were based on Standard Methods for the Examination of Water and Wastewater, 1998 as shown in Table 3-1.

Table 3-1 Parameters and analytical methods of water samples

Parameters	Analytical methods
1. Temperature	Thermometer
2. Transparency	Secchi disc
3. Salinity	Refractometer
4. Conductivity	Conductivity Meter
5. pH	pH meter
6. DO	Azide modification method
7. BOD	Azide modification method

Source: Standard Methods for the Examination of Water and Wastewater, 1998

b) Groundwater measurement

The measurement of groundwater quality is different from the surface water one. The researcher chose 14 ground water wells by purposive sampling and each station represented for each village. In each station the ground water were collected from the nearest tap of water supply.

In each station, the researcher analyzed chemical property which covered salinity and pH. Refractometer and pH meter were used for analyzing salinity and pH respectively. Moreover, additional fluoride data derived from Tambon Bangpla public health office was used to assess the quality of groundwater.

c) Soil measurement

There were 4 selective stations which comprised control points

for 2 stations at rice paddy that far away from shrimp farm and sampling sites for 2 stations at rice field near shrimp farm. Soil sample in each station was collected at a depth of 20 cm with a distance far from shrimp pond of 3, 10, 20 and 100 m respectively (Figure 3-2).

Soil samples were dried under the shade for 2 days. Unwanted materials were removed by passing through a 2 mm mesh sieve. Later the soil was analyzed for salinity and pH by electrical conductivity method and pH meter respectively (Soil Analysis Division, Land Development Department, 2001). The results were described in Appendix B.

2) Indepth interview stakeholders

Stakeholders composed of many groups such as head of the village, public sectors, private sectors, local people and Tha Chin Conservation Group. Indepth interview was used for interview those representatives of each group. The principles of selecting representatives of the target groups were those who were directly responsible for environmental management. They were bold to give their opinion on the studied issues. They were ready to pay a close attention and cooperated which were the most important matter. The guideline questions were shown in Appendix E. The interview records were filed daily for the future use in writing research.

3) Focus group discussion

After getting a general idea on the environmental management and information from those related personnel, the interviewer conducted soil and water analysis to fine the present local environmental management situation. The next step was to organize the focus group discussion in order to report the environmental problem condition and discuss the problem, including the causes and the solutions. Since the impact from the salt water prawn farming in the fresh-water areas caused damage on the soil and water resources, rice farmers and prawn raisers were therefore chosen as target groups in the focus group discussion. Two each of the both groups were invited to debate in the discussion which were held three times. The number of

participants were limited so that they had enough time to give their opinion. The participants in the first discussion were from villages number 1 to 8. The second meeting were from villages number 9 to 15, and the third were TAO members. The agendas were to exchange opinion, solutions, roles of TAO and difficulties in solving problems. In each meeting, two research assistants were present to encourage participants to give their opinion on environmental problem condition, causes, methods of solving and wrote their opinion on a flip chart. The researcher then condensed those idea into mind mapping, and asked the participants to consider the result.

4) Non-participant observation

Non-participant observation was used to examine the TAO administration. As the researcher spent a long time in the community to get a familiar with the villagers by joining in many meetings and community activities. It was a good opportunity for the researcher to meet stakeholders, discuss about environmental problems, and observe ways of life of local people.

5) The stakeholders brainstorming

The last step of data collection was a meeting. The objective of meeting were to create good governance indicators and find out a guideline for local resource management. There were many stakeholders who joined in meeting, for instance officials (who are representative from Tambon Bangpla Water Works Authority, Tambon Bangpla Public Health Office, Mobile unit of Department of Land Development), the TAO members, heads of villages, private sectors (merchant), and local people (farmer, shrimp farmer, and gardener). At the beginning, the researcher presented environmental problems and information from focus group discussion. Then the researcher divided stakeholders into 3 groups for each role play as: 1) the government official; 2) the TAO; and 3) local people. Each group was assigned to prioritize environmental problems in the community and investigated their causes. Then discuss about good governance indicators and criteria under their role play. Each member in each group would write on a paper to express their opinions for further discussion. On the discussion, research assistants would facilitate all

stakeholders to share their opinion. The head of each group, selected by members would present outcome after discussion. Finally, the researcher verified these indicators with reviewed ones.

3.3 Data analysis

The main aspect for analysis is how to apply good governance in local resource management of the TAO which leads to sustainable resource management.

This research was analyzed in 3 aspects which are:

3.3.1 Local resource management problems

To analyze factors that influence local resource management leading to water and soil deterioration. The criteria for analysis are:

- 1) Existing environmental condition in Tambon Bangpla when compared with an environmental standard and causes of the problems.
- 2) Stakeholder analysis was used to detect roles of all sectors in local resource management. In addition, the researcher wanted to examine relationship between them under the condition of policies, economics and cultures.

3.3.2 Good governance in local resource management of the TAO

To use the obtained indicators for the performance assessment of the TAO administration and analyze how to apply good governance in local resource management which emphasizes on community participation.

3.3.3 The guideline for local resource management

Finally, the researcher proposed the sound guidelines for local resource management which were derived from environmental management concepts and stakeholders brainstorming. The propose guideline would be considered under the community's context.

CHAPTER IV

NATURAL RESOURCE MANAGEMENT

OF TAMBON BANGPLA

This chapter presents the study outcomes of existing condition of environmental management in Tambon Bangpla and its stakeholders' points of view about local environmental problems which lead to a guideline of Tambon Bangpla environmental management. The issues in the study were:

- 4.1 Socioeconomic of Tambon Bangpla
- 4.2 Environmental quality
- 4.3 Existing environmental management
- 4.4 Environmental management discussion

4.1 Socioeconomic of Tambon Bangpla

Tambon Bangpla is situated in Amphoe Banglen, Nakhonpathom province covering 29.09 square kilometers of land. It was divided into 15 villages with 6,871 population (in 30th January, 2004). Its geography is a flood plain of Thachin river basin where the main river flows through the northeastern region and separated this area into two parts. The main area is on the west of river bank. There are several branch canals flowing through the Thachin river--Tha San Bangpla canal, San-Bangkao canal, etc. These canals are the source of water supply for agriculture purpose in Tambon Dontum (Silapakorn University, 2003). The area has a fertile clay soil attribute but it has a poor water drainage with high acidity. This is due to sulfur mixture in the soil texture which is a common soil property in Amphoe Banglen.

The major land use, of 83.96 percent, was agriculture (within the agricultural area, it comprised paddy field for 65 percent, field crop 3 percent, fruit trees 2 percent, aquaculture 24 percent, and others for 6 percent). Water supply for agriculture came from irrigation and surface water; therefore, some area could cultivate rice for 3 times a year but normally 2 times a year. The households were settled along Thachin river bank. The area that had a high density population were Moo 10, Kao Rat market and Moo 6, Bang Pla temple including Moo 13, Ban Nong Pab where agricultural production was high (Silapakorn University, 2003).

The majority population in Tambon Bangpla are farmers who account for 90 percent. Their secondary occupations are laborers and government employees who accounts for 10 percent. There are also supplementary jobs generating from local female members or housewife groups to run community stores. The social residents are divided into the following three main groups.

1. The original Thais reside in villages number 1, 2, 3, 4, 5, 6, 7, 8, 9 and 13
2. The Chinese-race Thais live in village number 10
3. The Black Thai ethnic group in villages number 11, 12, 14 and 15

Chinese people lead their lives very similar to Thai families. Most Thais here are Chinese-original persons. They are blended with the Black Thai which worship ancestral spirit and have their own unique custom. The Black Thais account for 30 percent of the Tambon population (Silapakorn University, 2003) and most of their surnames begin with the word "Petch". This indicates that their original clans are from the province of Petchburi. Their primary occupation is farming and most families are extended families. Most of them are middle and low-class resident with some high-class which hold the positions of village leaders, and operate private business and serve as government officials. Some of low-class citizens are very poor and depend on the government welfare money. They are unattended old people – nobody looks after them. The Black Thais' way of life is summarized as follows (Satsanguan, 2002):

The family pattern is based on the relative-clan tradition. The clan worships the same ancestral spirit or “ghost”. Junior people respect senior people.

1. Belief. At first, the Black Thais were people without religion because they worship ghost. After living in Thailand for a long time, they became Buddhists, but do not give up ghost worshipping.

2. The way of life. The Black Thais are home-stead attached people, but this tradition gradually fades down. This may be because they have lived so comfortably in Thailand, coupled with they are very patient and peace-loving people. They are not aggressive and do no harm to any community. The Black Thai are diligent and economize. They make their own household items by using natural resources, such as baskets and similar gadgets.

Currently the black Thai people are more and more acceptable in Thai societies for they have a unique identity and government officials exploit this in tourism industry. In fact, practically all Black Thai young men and women have adapted themselves to normal Thai way of life (Chomphunit, 1996).

The three groups mentioned above have different customs but they live together harmoniously. This indicates the effective management system of social order and the cooperation of the leader and the residents (Silapakorn University, 2003).

4.2 Environmental Quality

Environmental quality was examined in 3 issues: surface water, ground water, and soil, as they were fundamental resources for crop production. Due to the pertinently heavy use and agricultural revolution, the fertility has been deteriorated. All samples were collected on 30th August 2003. The results were analyzed as follow:

4.2.1 Water Sample Analysis

Water samples collected in each station were analyzed in physical and chemical parameters. The results were shown below:

1. Physical Parameters

Physical parameters examination results: temperature, and transparency were shown as follow (Appendix A):

1) Temperature

Temperature is very important as it relates to several mechanism for instance dissolve ability of gases and minerals, evaporation, respiratory, growth, organic degradation and living organism's metabolism. In Thailand the average temperature was found 23-32 degree celsius (Chaowanklang, 1991). The temperature influences the conductivity and dissolved oxygen (DO) in the way that when the temperature is high, the DO decreases; on the contrary, when the temperature is high, the conductivity is high.

This study showed that the air temperature ranged from 29.9-37.0 degree celsius (33.4 at an average). It was found that the maximum temperature (37 degree celsius) was at the 8th station (the middle of irrigation canal) because it was collected at noon while the minimum temperature (29.9 degree celsius) was at the 16th station (the end of Thri Ngam canal) which was the last station, the sun closely set.

For water temperature, it ranged from 30.0 – 32.0 degree celsius (31.2 at an average). The water temperature in each station did not much vary because water can absorb the heat.

2) Transparency

Transparency indicated the capability of light which penetrate to the water. The suitable transparency ranges from 0.30-0.60 m which was suitable for living organism and photosynthesis of phytoplankton, a primary production in water.

Transparency of more than 0.60 m indicates that the water lacks of fertility; in contrast, the transparency of less than 0.30 m indicates that it was over turbidity and phytoplankton (Chaowanklang, 1991).

The result of this study showed that the transparency ranged from 0.35 – 0.55 m which is suitable for living organism and fishery. However, this results could be inferred from the study that when collecting samples were diluted by the large amount of amalgamated rain into the water body. In addition, for some of the sample sites, the water was rather static, resulting in the precipitation of the suspended particles to the bottom of the waterways. This was the reason why the transparency increased.

2. Chemical Parameters

Chemical parameters which were Dissolved Oxygen(DO),Biochemical Oxygen Demand (BOD), conductivity, pH and salinity, produced results as follows:

1) Dissolved Oxygen

Oxygen could be hardly dissolved in the water because it does not have chemical reaction with water. The dissolve of oxygen depends on air pressure, water temperature and salinity (Chaowanklang, 1991).

This study showed that the DO of all stations ranged from 1.10 – 8.65 mg/l. The maximum DO was found in the beginning of irrigation canal because irrigation canal received high water inflow from Mae Klong dam. In addition, the irrigation channels were well designed for defending contaminated water. Moreover the high flow rate of water body could increase dissolved oxygen into the water.

While the minimum DO was found in the 1st station (Thachin river before merged with Tha San – Bangpla canal) because the sample collecting point at this station was the deepest of all (5.20 m). Consequently, oxygen dissolved capability and the photosynthesis of plants were low resulting in low oxygen.

2) Biochemical Oxygen Demand

This study showed that the average BOD of all stations ranged from 0.72-4.24 mg/l. The maximum BOD was found at the 5th station (the beginning of Ar-ma canal) because the water body was rather static and the channel was narrow. Moreover, it flew through aquaculture farming along two sides in which some of them drained wastewater to the canal. The wastewater included chemical deposit and rice decay which need more oxygen to decompose therefore, the BOD was high.

The water body was influenced by tide. At the high tide time waste water was diluted, therefore, the water quality is better than the low tide.

While the minimum BOD was found at the 7th station (the beginning of irrigation canal). This implied that the water has low contaminated organic compound.

3) Conductivity

Generally, the average conductivity in natural water body ranges from 150-300 $\mu\text{s}/\text{cm}$ or 100-200 ppm TDS (Chaowanklang, 1991).

This study showed that the minimum conductivity (140 $\mu\text{s}/\text{cm}$) was found at the 7th station (the beginning of irrigation canal) as it was clean water which was drained to support the canal in these areas and the water has not been yet contaminated.

The maximum conductivity (780 $\mu\text{s}/\text{cm}$) was found at the 3rd station (the beginning of Bang Hway canal) because the water body in this station was the type of lotic. The surroundings thrived in agricultural activities such as fruit trees and duck farm which drained waste water to canal resulting in more particles in water body.

However, the average conductivity was 393.81 $\mu\text{s}/\text{cm}$ which was over the average value. It was simply that there were many contaminated particles in water

for instance waste water drained from aquacultures, chemicals from agricultural activities.

4) pH

The value of pH in natural water body ranges between 5 and 9. Its value depends on the geography such as soil, rain quantity, land use and the existing of microorganism and phytoplankton in water.

This study showed pH of water samples from all stations ranging from 6.78 to 7.95. The average pH was 7 representing a general pH of water from natural sources in this area.

5) Salinity

Salinity was different in each place depending on the soil series. For freshwater, the salinity should be none; and for sea water, the salinity is about 35 part per thousand (ppt). The salinity affects the living organisms in fresh water since they can tolerate the salinity at 7 ppt (Chaowanklang, 1991).

Although this area had saline shrimp farming that had to use saline water and drained waste water to natural waterway, the average salinity of all stations was 0 ppt. However, this might be inferred from the rainy season that the salinity was diluted by rain.

Thachin river before and after merged with Thasan Bangpla canal was class 2 and 4 respectively. This might be assumed that before merging, the water body flew faster making the particle less precipitate. But after merging (Bang Pla temple site), the water body had more organic compound from activities around the area that need more oxygen for the decomposition. As a result, the BOD was high.

4.2.2 Ground water analysis

The results showed that the average salinity of all stations were 0 ppt which was classified as freshwater. This meant that the water was not contaminated by salt. Although there was inland shrimp farming but this did not affect the ground water because the ground water well was drilled through stone layer to make sure that there was no salt effect.

It was noted that the ground water in Moo 3 was 3 ppt as it probably came from soil materials because the soil salinity near this well was found at high level.

The pH ranged from 7.4-8.8 which was considered suitable for consumption while the standard was 7.0-8.5 (Sirisingh, 2001). When considering fluoride, it ranged from 0.75 – 2.86 ppm (1.81 ppm at an average) which was considered not suitable for consumption as the maximum limit of fluoride in consumption should not exceed 1 ppm (Sirisingh, 2001).

4.2.3 Soil quality analysis

The results showed that the soil salinity in control group collected from rice field was moderate to high. This was probably came from soil materials as this Tambon was acid sulfate soil while the average pH was 6. It was noted that the pH in control group and experiment group collected from the land near shrimp farm were not much different (Appendix B).

Soil salinity of pink shrimp (*Metapenaeus spp.*) farm (6.19-9.97 ppt) was lower than giant tiger prawn (*Penaeus monodon*) farm (12.42-13.96 ppt) because it was fed in lower salinity. Considering EC of shrimp farm in Moo 3 it has the highest salinity at the distance of 3 m away from shrimp farm. The salinity tendency decreased when the distance from shrimp farm increased. On the other hand, the salinity at Moo 15 was unstable because the soil was still flooded with water. As a result, soil salinity was unstable as it depended on salt evaporation at any spot.

4.2.4 Environmental quality analysis discussion

According to existing environment examination in Tambon Bangpla, the samples were collected on 30th August 2003. For surface water, the results showed that pH, salinity, temperature and transparency were in standard limit but conductivity (140-780 $\mu\text{s}/\text{cm}$) was over the average value (150-300 $\mu\text{s}/\text{cm}$) (Chaowanklang, 1991). The conductivity was high. This could be explained through the ionization process of inorganic salt in water body. While DO and BOD were classified in class 2 at irrigation canal; class 4 at Tha San Bangpla canal, Saingam canal, Don Khamin canal, Talad Ko Rat canal and Bang Hway canal but Sal Jao Ar-Ma was classified in class 5.

The results showed that the water quality of Thachin river was over the standard limit as it was classified between the fourth and the fifth categories which was normally explained suitable for industrial utilization. While the water quality of all canals of these areas was classified in the third category which was normally explained suitable for agriculture utilization but it was over the standard limit to the forth which was used for industry.

The cause of low water quality came from domestic and agricultural waste discharged to the river. Although the water samples were collected on rainy season in which the water samples were diluted by the rain, the water quality was still poor. In other season the water quality might probably get worse. While the ground water was on the standard. It could be utilized in household but was considered not suitable for drinking as the fluoride level exceeded the standard limit which probably harm consumer's health. This showed that the saline waste water discharged from shrimp farm did not have an effect on groundwater.

From the soil analysis, it was found that the samples were clay soil. The pH was moderated acid and salinity was moderate-high which could affect some plants. The cause of soil salinity was soil materials and inland shrimp farming including agricultural activities. The salinity accumulated from any activities might disperse through ground water flow and could lead to conflict problem among farmers. This problem should not be neglected.

4.3 Existing environmental management

Since this area was an agricultural community, the existing environmental management was related to water and soil resources as fundamental elements of an agricultural production. Other environmental problems, for example dust and waste water were included in the study.

This study classified environmental problem into three categories, those were: 1) water management; 2) soil management; and 3) other environmental problems. The results were shown as follow:

1) Water management

Tambon Bangpla is thrived with water resource as Thachin river flows through this area and there are several main canals and good irrigation system which is suitable for agriculture, especially for rice field. Although the rice field decreased as rice farmers turned to do aquaculture and the young generation went to work in factory instead, the majority of people still grew rice and kept relation with natural resources. The change in natural resources could undoubtedly affect their lives.

It was found that local people had asked the TAO to handle the water problems such as saline water from shrimp farm and shallowed waterway by water hyacinth. The way to solve the problem of the TAO was that they had asked for the corporation from polluters to correct their measures. Questionably, the budget was mainly allocated only for elimination of water hyacinth.

Some people viewed that the water problem caused by activities outside their area. In fact, the people who live along the waterway took part in the deterioration of water quality by dumping solid waste into water body. In addition, waste water from the discharge was drained from inland shrimp farms.

2) Soil management

Soil in Tambon Bangpla was a fertile clay soil which was suitable for agriculture, but the misuse of land (e.g. saline shrimp farming) and intensive agriculture have deteriorated its fertility. This led to a conflict between 2 groups of farmers. Presently the problem was not severe since the shrimp farm area has decreased according to the low price and the enforcement of law (The Enhancement and Conservation of National Environmental Quality Act, B.E. 2535 (1992), Section 9) to control inland shrimp farming.

Basically, the stakeholders knew about soil problem and its causes. The causes of soil deterioration in their view were from continuous agricultural practices, over utilization of fertilizer, and saline shrimp farming. However, some farmers thought that the salinity from shrimp farm was not high enough to cause serious problem. Although the saline water was gradually diluted by the time of the shrimp growth, the salt still accumulated in the soil and probably absorbed to ground water which finally affected water quality.

3) Other environmental management

Other environmental management was dust from rice mills which was determined as an air pollution which is more serious in the winter. Another crucial problem was solid waste. Most people disposed solid waste by open dumping without good management. At present the TAO marked this problem as an important issue, but they quoted that they lacked financial support and qualified staff as well as a new appropriate landfill site. Moreover, there was inadequate public participation in paying for solid waste management fee.

4.4 Environmental management discussion

As mentioned, it should have a long term plan to solve these problems. Other factor that caused the problem was a commercial agriculture as the government policy aimed to promote advanced agriculture which caused intensive utilization of fertilizer and pesticide. The chemical substances are not only costly but also deteriorate

environment. Moreover, it accumulates in soil and water resource especially for the use of hazardous chemical like endosulfan to eliminate golden apple snail which affects environment and aquatic life (Technology of Environmental Management, Mahidol University, 2001).

An agricultural and economic development had affected the people's way of life and local resources. The impact that occur was an indicator for economic development. The fertility of soil and water resource was decreased by the misuse of land which was implied that its value of resource was decreased.

There are many stakeholders which have various responsibilities in local resource management. In particular, the TAO solves the pollution problem when there were complaints from villagers, and need TAO to force the polluters to control the pollution. Some polluters cooperated but some did not, therefore the problem was only temporarily solved. As a result, they quoted that they lacked power and financial support as well as had limitation in the enforcement of regulations.

Other organization was Mobile Unit, which its member came from several department: Land Development Department, Department of Agriculture, Department of Fisheries and Department of Livestock Development. They moved to the area in their responsibility or when people requested them to inspect the problem such as salt affected soil and agricultural product. As there were a lot of responsible area, they could not inspect all area. In the case that the pollution was severe, central government agencies for instance the Pollution Control Department and the Industrial Work Authority will come to inspect it. However, the TAO has not yet a long term plan and clear regulation in environmental management.

In the field survey, the researcher and the stakeholders have some different point of view. The stakeholders viewed the environment as a micro-scale which related to their ways of life and production's factor but did not think of sustainable use. While the researcher viewed the environmental problem as a macro-scale which all resources related to each other and should not neglect sustainable use.

As mentioned, the water and soil quality was low to moderate, but the stakeholder mostly paid an attention to solid waste. In contrast, the researcher paid attention to soil and water resources because water and soil were fundamental factors for crop production that should be thought in sustainable way.

In order to solve environmental problem, we should view from epic view as it was local people needs and open a chance for public participation which led to sustainable development. According to such management, the sufficient and appropriate knowledge was very important. Generally, environmental management should be based on the right database, community ecological knowledge and the concept of holistic approach which led to sustainable management (Jankao,1982; Tantawirun, 1985). But existing environmental management in Tambon Bangpla did not comply with this approach. The use of resource was not concerned about future sustainability.

At present, there was no plan to solve the problem and stakeholders view the management separately. Moreover, there should be an organization to monitoring environmental quality. It should be the TAO duty as mandated by the Decentralization Act. However, setting an organization to be responsible in environmental management is an another alternative. In addition, the village volunteers are the most important group that will help strengthen good governance in environmental management in order to achieve sustainable development.

CHAPTER V

GOOD GOVERNANCE INDICATORS ON ENVIRONMENTAL MANAGEMENT

The researcher had selected Tambon Bangpla in Barnglen District, Nakhonpathom Province as a case study on good governance indicators on environment management. The researcher had requested cooperations on involving people in designing the indicator such as the TAO, public sectors, Kamnan, head of village, and local people. The cooperation reflected participation of finding solutions on environmental management leading to good management. The contents can be presented in three headings:

- 5.1 Indicator significance
- 5.2 Good governance indicators on environmental management
- 5.3 Environmental management guidelines

5.1 Indicator significance

Most people accept that concept of good governance is a good principle and useful to encourage democracy in Thai society. Therefore, efforts of making good governance are essential on practices in motivating people participation on decisions making and cross examination. This endeavor will support government stabilization and create credibility in the nation and international levels leading to reduction on corruption (King Prajadhipok's Institute, 2001). Thus, development of the indicators or devices used on evaluation of good governance principle with effective practices is essential.

Currently, there are various sets of existing indicators with or without good governance principles depending on their definitions and aspects. These differences count on types of administration, culture, society, community and organizations' objectives of designing indicators. There is no study of designing indicators on environmental management. As a result, forming indicators aiming at good governance on environmental management of the TAO in this study might lead to good management. Good governance principle evaluation suggested the community with suitable indicators gathered from participation of the involving sectors, under principles of believing in practices based on designed indicators will lead to a good environmental management. The TAO and villagers can use these indicators as a tool in self evaluation for improvement.

5.2 Good governance indicators on environmental management

The good governance indicators in this study were developed from two sources: literature reviews and views of involving people in Tambon Bangpla by conducting stakeholder brainstorming, focus group discussion, interviews with many groups of people and observations in that area. Based on good governance principles, the indicators can be compared and summarized in six aspects:

1. Rule of law

On rule of law, Tambon Administration can issue its regulations on environmental management (according to the Constitution 1997, Section 284) such as littering or waste water prohibition. Significance of the rule of law refers to enforcement and control of restrictions on environmental management. Whether the restrictions would be implemented or not depending on the community cultures. Efficiency on indicators accounted on effective enforcement. The selective indicators are shown on Table 5-1.

Table 5-1 Comparison of the indicators on rule of law from the literature reviews and brainstorming in the field survey.

Indicators selected from literature reviews	Indicators selected from brainstorming	Indicating criteria
The TAO enacting its regulations relating to local resources in accordance with authorization required by law	Enacting law controlling and punishing individual causing pollution such as waste dumping into water resources	Setting rules on pollution control
The TAO's protection of individual rights and freedoms on local resource conservation		
The TAO's authorities have a freedom in decision making.		

The selective indicators in this study, shown in Table 5-1, were from stakeholders' view. At present, the testing of these indicators have not been done yet. Rule enforcement is a significant purpose. The finding referred to difficulties on control and punishment on smuggling individuals causing pollution problems. Currently, the TAO of Bangpla has not clearly ruled out restrictions on environmental management. The enforcement of rule of law principles depends on the community cultures. However, this study found that the villagers seem to use compromising culture which cause difficulties on punishment; verbal warning may be more appropriate.

2. Integrity

On integrity, the finding illustrated public awareness in environmental management and ethic of the TAO's officials. The selective indicators are shown on Table 5-2.

Table 5-2 Comparison of the indicators on integrity from the literature reviews and brainstorming in the field survey.

Indicator selected from literature reviews	Indicator selected from brainstorming	Indicating criteria
No record of charging on corruption at TAO		
Equal service on community residents		
Disciplinary Office		
The TAO's interest in solving local problems	People awareness on environmental conservation	Public relations on audio-announcement, intercom system and sheets

There was no initiative and significance from the TAO among integrity indicators on environmental conservation which leading to people awareness. In fact, people awareness is imperative in solving environmental problem as its causes. These practices will saving environmental budgets of the TAO. People awareness and participation on environmental conservation should be promoted as these are the TAO's significant strategies for sustainable environmental management, under limited budgets.

3. Transparency

On transparency, the finding illustrated Tambon Administration rules or environmental management planning in response to needs of stakeholder. The selective indicators are shown on Table 5-3.

Table 5-3 Comparison of the indicators on transparency from the literature reviews and brainstorming in the field survey.

Indicator selected from literature reviews	Indicator selected from brainstorming	Indicating Criteria
The TAO presents its rules to villagers.		
The TAO is consistency and broad public relations about rules, budgets, expenditures, and voting in Council on significant meetings.		
There are follow-up system / evaluation, or listening views of effected parties or local people on problems of environmental management.	There are public participation on solid waste management.	People participate in meeting about solid waste management planning.
No record on corruption or law disobey over the past year of Tambon Administrative committee and member		
Forming public investigation on facts during a period of conflicts between the TAO's officials and local people.		

The selective indicators were developed from the views expressed by involving parties. Currently, waste disposal management has not been implemented. Forming public hearing for people proposing their needs would be required when making Tambon development plan. The study presented the TAO's efficiency on public relations on the community rules and meeting results. Disciplinary disobedience in some areas was literally demonstrated. The finding suggested insufficiency of the only indicator on this principle in leading to transparency progress. This reflected recommendation on increase of indicators relating to public relations of the TAO to its people. The indicators on public relations referred to setting up the community board for putting some information or interesting news such as monthly meetings, brief

official articles, budgets of the TAO about incomes and expenditure. Purchasing committees which represent local people should be selected for inspection transparency of the TAO in any projects.


4. Public participation

The TAO would allow local people to participate in environmental management in order to get involved in making development planning and pollution alleviation. For examples there is no waste disposal into rivers or no water hyacinth in the areas. Management on problem solving between the TAO and its residents is fundamental.

The selective indicators are shown on Table 5-4.

Table 5-4 Comparison of the indicators on public participation from the literature reviews and brainstorming in the field survey.

Indicator selected from literature reviews	Indicator selected from brainstorming	Indicating criteria
The TAO giving opportunity to people participating in expressing views on enacting rules, proposing problems / environmental projects of making development planning.	<i>The TAO giving opportunity to people participating in making its community rules</i>	<i>Forming referendum making community rules.</i>
The TAO assigning referendum representatives holding positions as Board Committees in purchasing and employing personnel relating to natural environmental management.	<i>The TAO assigning its referendum representatives holding positions as Community Board Committees on purchasing and employing personnel.</i>	<i>Assigning two referendum representatives holding positions as committees on purchasing and employing personnel</i>
The TAO giving opportunity to people participating on its council meetings over the past year.		

Indicator selected from literature reviews	Indicator selected from brainstorming	Indicating criteria
The TAO gives opportunity to stakeholders in proposing views on environmental management and their participation in problem solving.	<p>People and business entrepreneurs with assistance on waste problem managing.</p> <p>People's assistance on canal digging and weed eradicating.</p> <p>People participation in reducing the chemical usage and inorganic fertilizer for preventing soil deterioration.</p>	<p>Waste reduction</p> <p>Organic farming</p> <p>The participation in soil deterioration prevention</p>
The TAO has developmental capability of people in environmental management		

Noted: Inclining letters showing selective indicators from interviews and observations

Considered as a significant factor of having participated in good governance, the TAO must adapt its operational practices and attitude in order to be able to work with community and local people. TAO will be an open organization with more transparency. With more opportunities of involvement, local people will be aware and monitoring in working performance of TAO; and the representatives will be selected from villages. This will bring more benefits to their community.

5. Accountability

On accountability, the finding illustrated complying rules on the TAO of maintaining local resource required by law: maintaining public water ways such as canals, being acknowledged of environmental matters surrounding the area, and suitable planning on solving problems.

The selective indicators are shown on Table 5-5

Table 5-5 Comparison of the indicators on accountability from the literature reviews and brainstorming in the field survey.

Selective indicator from literature reviews	Selective indicator from brainstorming	Indicating criteria
TAO's performance on environmental management and other tasks required by law.		
TAO's attention on difficulty of local people in environmental management, with complaining taking system and clear process of problem solving.	TAO's management on environmental problems if complained: dusting or releasing waste water to shrimp farming.	Seriousness on control of business owners processing on problem solving.
TAO's acknowledgement of problems on natural resource deterioration in the area and resolutions being in progress.	TAO's problems solving on shallow canals causing from water hyacinth.	Reduction on water hyacinth Increase of community cleanliness
TAO's control of black shrimp farming in areas of fresh water.		
Water conservation and control waste water releasing into water resources.	Prohibiting waste water releasing to natural water resources Increasing water flow from dam to push waste water – salty water	Publication data on environmental conservation and mandate rules to control environmental problem Coordinating with Irrigation Office

On accountability, it is noticeable that the indicators selected from brainstorming presented increasing numbers of the indicators more than any of other rules. This might result from the TAO taking some partial tasks: making developmental plans, preserving natural resources in its area, or participating in meetings. Overall, the TAO had no long-term planning on natural resource

management. TAO coordinates with individuals causing pollution only if there were complaints on environment issues. If more cautious of taking responsibility based on the indicating rules, the TAO would lead its operation to good management system.

6. Value for money

On value for money, there was no clear indicators. Acquiring on additional details should depend on quantitative data and elaborate analysis. The designed indicators presented campaigns/public relations in acknowledging people on environment: reducing waste and recycling through no waste disposing into rivers. These practices encourage people for not damaging environment and using natural resources with worthiness.

The selective indicators are shown on Table 5-6.

Table 5-6 Comparison of the indicators on value for money from the literature reviews and brainstorming in the field survey.

Selective indicators from literature reviews	Selective indicators from brainstorming	Indicating criteria
The TAO with management on purchasing-employing personnel focusing on budget saving		
The TAO annual development plans, sequent ordered based on urgency of projects / affairs		
The TAO's projects progressing for it residential benefits		
The TAO using of natural resources for maximum benefits		
The TAO campaigning people of using natural resources with worthiness	Campaigns on waste recycle	Public relations through microphone system, sheets, advertising leaflets

Selective indicators from literature reviews	Selective indicators from brainstorming	Indicating criteria
The TAO with efficient budget distribution on environmental management		

On value for money, community development projects should be orderly evaluated on their priority and values. The value for money indicated how community development projects would be used and whether the community would benefit from the project usefulness, sustainable, or improvements of socio-economic issues through environment and quality of life.

It is observed that good governance indicators in environmental management expressed by stakeholder were mainly focused on techniques. These have been basically followed environmental problems in the area, or requiring supports from public sectors on knowledge and budgets. It is a reflection on the concept of being dependent on the government among Thai people deeply rooted with top-down management. Despite its period of enacting new constitution of decentralization in allowing people with their rights of self-managing on natural resources, their final goals cannot be achieved because of personnel knowledge, budget, and values in Thai society.

Therefore, it is taking time to develop good governance on administration in all sectors of the society, as stated in the Ninth National Economic and Social Development Plan. Considering indicators of all six principles, it suggested the TAO achieving good governance only if its operation follow designed indicators by people participation in bringing good governance on environmental management. At present, the TAO has implemented only elimination of water hyacinth and dusting coming from rice mills. Other environmental issues have not been significantly emphasized. Under evaluation on designed indicators, TAO of Bangpla worked on environmental aspect about 50 percent of all designed indicators and it further created many concepts

without actual practice. The application of good governance into effectiveness on environmental management must depend on cooperation of all stakeholders.

Summarizing selective indicators from the study are shown on Table 5-7.

Table 5-7 The good governance indicators on environmental management from the study.

Good Governance Principle	Indicator (s)	Indicating criteria (s)
1. Rule of Law	Enacting law controlling and punishing individual causing pollution such as waste dumping into water resources	Setting rules on pollution control
2. Integrity	People awareness on environmental conservation	Public relations on audio-announcement, intercom system and sheets
3. Transparency	There are public participation on solid waste management.	People participate in meeting about solid waste management planning.
4. Public participation	The TAO giving opportunity to people participating in making its community rules	Forming referendum making community rules.
	The TAO assigning its referendum representatives holding positions as Community Board Committees on purchasing and employing personnel.	Assigning two referendum representatives holding positions as committees on purchasing and employing personnel
	People and business entrepreneurs with assistance on waste problem managing.	Waste reduction

Good Governance Principle	Indicator (s)	Indicating criteria (s)
	People's assistance on canal digging and weed eradicating. People participation in reducing the chemical usage and inorganic fertilizer for preventing soil deterioration.	Organic farming The participation in soil deterioration prevention
5. Accountability	TAO's management on environmental problems if complained: dusting or releasing waste water to shrimp farming.	Seriousness on control of business owners processing on problem solving.
	TAO's problems solving on shallow canals causing from water hyacinth.	Reduction on water hyacinth Increase of community cleanliness
	Prohibiting waste water releasing to natural water resources Increasing water flow from dam to push waste water – salty water	Publication data on environmental conservation and mandate rules to control environmental problem Coordinating with Irrigation Office
6. Value for money	Campaigns on waste recycle	Public relations through microphone system, sheets, advertising leaflets

Considering on selective indicators, each of good governance principle has different indicators. The highest numbers of indicators focus on public participation and accountability. These principles depended on community contexts, acknowledgement of stakeholder, and supports of public sectors. Despite selective

indicators of each principle presenting small number, it is believed that actual practices would be most efficient on management: enacting enforcement law or campaigns on people awareness. If efficiently applicable, these principles would be a merely rooted-problem solving method. On community administrative fundamentals, transparency for cross-examination and giving opportunity to people participation must be primarily focused. The indicating criteria on this study were not evidently illustrated and must be properly adapted into the community for the future research.

5.3 Environmental management guidelines

Under rules of good governance administration, the concept on environmental management must be participated by involving people in all sectors: the TAO, community leaders, public, private, and people. According to decentralization policy, the TAO is most likely to take major roles of having rights and duties including management budgets. Designing good governance indicators on environmental management for evaluation of the TAO, the report suggested most indicators of involving people have not been practically demonstrated. Therefore, management process on local resources must be essential for actual practice. These practical issues gathered from brainstorming of stakeholder and related researches can be presented as follows:

1) Environmental management planning

Currently, the TAO has taken responsibility in making its annual development plans and the five-year plan. The community environmental management is a plan must be stated in its development planning. The finding showed insignificance of environmental management planning, considered as only a small proportion comparing to major development projects. Most budgets have been spent on infrastructure projects because of its masterpiece of work clearly suiting people needs. Increasing planning and distributing budgets on environmental management should be advised. Having good environment directly affect living quality of the community residents and to a fundamental production for living. The environmental issues should

cover on giving opportunity to people of having participation in proposing problems, management, and arranging public hearing for listening views of the local people. The TAO should orderly consider on problem significance and distribute budgets with fairness; rule enforcement on environment is to be effectively used.

In addition, the TAO must control practices under rule of law or formed agreement considered as taking responsibility on tasks given. Management on various development projects must consider positive or negative results in a long-term period. Consideration on sustainability of ecological systems is one of the concerning issues: use of chemicals in eliminating water hyacinth affecting living organisms in water described as human food chain. Using machineries or manpower of chemical replacement is recommended as chemicals have such impact on quality of water and soil.

2) Using holistic approach in environmental management

Managing on environmental problems must be considered in holistic view. Considering only its partial problems were not suggested because all natural environmental recourses have close connection to one another (Tuntaraviroon and Smootsakorn, 1985). Factors affecting local resource management are considered as socio-economic, political, ecological circumstances. The current environmental management has not reflected its concept as stated. The TAO oversees problems as a partial management such as waste disposal problems. The community has less consideration on relationships between natural resources and waste problems effecting to water. Thus, the management must be continued to solve problems; a part of the problems counts on the TAO officials lacking knowledge on environmental management. The body of environmental knowledge is efficiently considered in leading management into the right direction based on its fact. Local administration should provide some training programs for the TAO on issues of environmental and fundamental ecological systems. The training should be aimed at acknowledging and understanding the connecting systems. Being unable to handle environmental problems if raised, the TAO should coordinate with involving sectors and ask for assistance. Problem-solving strategies must be adapted into prevention as its causes

rather following through. Most actual environmental causes are from man. People awareness and acknowledging are significant strategies on problem solving. The strategies are such as campaigns and public relations of making people realize and help conserving local resources. Waste disposal problem, for example, should be focused on campaigns and public relations of acknowledging people reducing waste and destroying it within their areas. These practices lead to waste reduction on its quantity needed to be managed. Waste disposal problem, in contrast, should not be emphasized on finding waste dumping sources or eliminating plans of bringing more difficulties to manage. Limited budgets are one of causes of the problems.

3) Reduction on agricultural chemicals

According to the government policy stating its significance on food safety of supporting Thailand as world kitchen, the Ministry of Agriculture and Co-Operative have made the plan on quality control of production and imported fruits and vegetables. The plan concentrates on the reduction of chemicals used for plantation, including soil improvement and making data information on toxicity of pesticide. It is the cooperation between Food and Drug Administration, Medical Service Department and Nakhonpathom Province Public Health Office. The quality control had emphasized on residual contamination of toxic substances in raw materials because of global markets demanding on non-toxic food. Organic farming has been advisable for preventing chemical substances contaminating in food causing harmfulness to consumers, including toxic accumulation on environment.

4) Resource restoration

Recovering deteriorated soil causing from saline shrimp farming and plantation without resting period by using organic fertilizer for its improvement and suitable resting. These soil nourishing methods include crop rotation or bean families in preserving soil fertility. Shrimp ponds is difficult to restore therefore, it should changes to fish farming for increasing another source of income. On conserving water resources, campaigning on no littering and releasing waste water to rivers is recommended. Housed sitting on river banks should have bags for intercepting fat or filtering food before releasing it to canals. Waste water from agriculture or shrimp

farming is suggested to be in process of cleaning by changing its condition self-purify before passing through public canals. Waste water should not be released from many sources at the same time because it may not have time on self-purifying. Residents living nearby water resources should help eliminating water hyacinth in their areas; a method used is by scooping up water hyacinth from making water clearly passing through. Besides, water hyacinth can be applied to compost fertilizer. Requiring people participation is another advisable resolution in cleaning water resource on national holidays, for example, Father's Day or Mother's Day.



CHAPTER VI

CONCLUSION, DISCUSSION, AND RECOMMENDATION

6.1 Conclusion

Since Tambon Bangpla has a fertile land and a plenty of water supply suitable for agriculture activities, it was part of areas promoted as the world kitchen. However, problems occurred from rapid economic development has deteriorated the environment for instance waste water discharged from industrial and domestic sectors. This situation has affected the way of life in Thachin river basin for production, especially saline shrimp farming has deteriorated soil fertility. Moreover, the promotion of commercial agriculture encourages farmers use technologies e.g. chemicals, fertilizer, herbicide and mechanical technique. Using such technologies is not only costly but also deteriorates soil and water ecology.

The Constitution of the Kingdom of Thailand 1997 mandates power decentralization. It has encouraged people to take part in public participation for local resource management. Tambon Administrative Organization (TAO) is an important institute which has authority in this matter. However, it is questionable how do they manage local resources and whether do they employ good governance in resource management?

From the water, soil and ground water analysis, the water quality in many stations was over the standard limit. This refers to agricultural waste, for instance chemical substances, rotten hay drained to public waterways, and waste water from aquaculture. These pollutants will later accumulate in soil. Soil salinity near shrimp farm was moderately to strong and pH was from light acidity to neutral. The

salinity of groundwater was none which was defined as freshwater. The ground water quality was not suitable for consumption because fluoride exceeded the standard limit. Moreover, other environmental problems were dust from rice mill which happened occasionally so the impact was not serious. The golden apple snail problem destroyed all green plant especially for rice and lotus. Therefore, the farmers use chemical substances to eliminate the pests but the chemicals affect aquatic organisms. Moreover, solid waste management was far more important that stakeholders were interested. As of now, it lacked of a proper management.

Under a baseline design of indicators reflecting good governance on environmental management and evaluation on the Tambon Administration, it is found that the current collective indicator has covered the six principles of good governance notified by the Office of the Prime Minister (The policy had been canceled, replacing by the Royal Thai Decree on restriction and good governance of the year 2003). Each principle has different indicators depending on perception, interests of people, and surroundings of areas. At present, operational performance of the TAO has not thoroughly covered because it still follows the management system of the Ministry of Interior. As a result, this action leads to lacking of initiative thinking of implementation on rule/order achievement. This refers to its issuing a formal mandatory forwarding to districts, the Tambon Administrative chiefs of their following policy without making clear understanding to practitioners. On any mandated core issues, practitioners complying with the ministry's orders are clearly presented but without success on its policy goals. Furthermore, it does not meet actual community needs. Misunderstanding and mistrust on each other resulted from incorporations between public sectors and local people on the operation of the TAO. Occasionally, some problems resulted from communities having incorporation on process from the TAO, including Kamnan, head of villages and local people. With capability of the enacting of Tambon, it will lead to public participation on decision making, cross examining on transparency, and effectiveness on budgets. This can be described as a partial of the Tambon political culture of taking accountability and integrity principles in managing natural resources. On its significant issues, good governance on environment will be achieved only if local people participate in

decision making on core issues involving environment of the TAO. Currently, public participating on the community issues are less likely.

The guidelines for environmental management can be proposed in four sections: 1) appropriate management planning and budget distribution on environment with public participation on bringing up their needs; 2) problem solving management by using holistic approach and strengthening environmental knowledge for the TAO and local people as to gain awareness of environmental conservation; 3) reduction the application of chemicals by changing to organic agriculture in responding to the public policy on food safety; and 4) natural resource restoration on soil and water with its improvement and resting periods by filling organic fertilizer and preserving water resources by not causing on water pollution, no waste dumping and no polluted water; waste water should be remedied before releasing to water sources.

6.2 Discussion

Political culture in Thailand especially patronage system has become a major obstacle to good governance development. On rule of law principle, it focuses on equality of enforcement, whilst patronage system reflects to advantages of using its privileges on corruption, and law avoidance causing environmental and ecological deterioration. These have resulted in weak law enforcement and instability on the TAO. Nevertheless, the community has its compromising on nature of living together. The alternative dispute resolution is non-compromise with rule of law but it is a way for reduction of conflict. However, there should be an encouragement of all good governance principles in all issues into practice. Particularly, people accountability should be emphasized on fundamentals of knowledge and long term planning on environmental management.

Based on designed indicators, the TAO's budget was previously used for infrastructure projects, whereas its budget on environmental management was less likely. The environmental budget mainly was spent for elimination of water hyacinth by using herbicide because it was cheaper than the excavation of canals. These practices

have been used without consideration of ecological system effecting from chemical substances accumulating in water. The TAO had no consideration on value for money in their projects. Budget allocation was distributed to every village in stead of prioritizing worthiness and necessity. As a result, budget allocation did not achieve the effectiveness as expected. These problems may result from the follow up:

- The budget regulation on current expenditures was promulgated without consideration on directions of long-term development planning but only focusing on urgent problem solving.

- The TAO pays no attention to any support from outward organizations. In case of severe problem, the TAO should act as a coordinator requesting assistance from stakeholder in solving problems in its area.

- The TAO has no incapability of income estimation or tax collection.

- The TAO's personnel has no knowledge and experience on budget allocation.

- The TAO has no effective internal-external control systems, including less people participating in cross-examination on community budgets.

Based on having good governance, environmental management must be organized under the actual data combining good governance principles in all issues: rule of law, accountability, public participation, value for money, integrity and transparency. Providing training programs on the knowledge issues to the TAO can encourage six principles of good governance on natural environmental management. It is difficult for the TAO to apply all good governance principles in environmental management. Its difficulties reflect to budget, personnel knowledge, and particularly people participating in examining performance of the TAO. The TAO's member who are the representatives of each village should ask their people needs then present them in during community meetings. Some TAO members are not good speakers and are afraid to present agendas during meetings. This is one of the problems of not having response. On people views, they are more concerning of their personal living rather participation on problem solving in the community.

However, community's contexts should be considered in enhancement of good governance in local resource management. Public participation and understanding in roles and duties of each stakeholder are important in environmental management.

6.3 Recommendation

6.3.1 Recommendation based on the study

1) The TAO's members should check on ideas and needs of local people living the area to present in a TAO monthly meeting and villagers should also be involved in TAO meeting to show the transparent decision making. Markedly, giving opportunities to Kamnan and head of villages of their participation is an encouragement of having cooperation in community development and problem solving. Furthermore, heads of villages are key communicators on public relations forwarding performance of the TAO. In addition, giving more opportunities to community leaders expressing views is imperative as they are considered to be people representatives in participating their ideas. Good governance indicators should be employed to be self evaluation and results should be used in self improvement.

2) People shall have appropriate access to information concerning the environment including information on their rights and duties which were mandated in the constitution, and the democratic regime.

3) Environmental management are best handled with the participation of all stakeholder. In case they lack of knowledge, scholars or specialists should be invited to participate in TAO council in order to discuss and provide information on existing problems or projective management since academic advice is essential for suitable operation.

4) There should be an environmental monitoring program to strengthening community groups such as Public Health Volunteer and Thachin Conservation Group to have consistency on scrutinizing on environmental quality. Youth groups aiming at environmental conservation principles should be formed.

6.3.2 Recommendation for further study

In order to achieve good governance concept in environment, further studies should be conducted:

- 1) Problems and impediments of the establishment on good governance for local organization, and prevention measures of corruption problems in community levels.
- 2) Improvement of rules, orders and restrictions of the TAO in accordance with good governance principle.
- 3) Long term planning on environmental problems related to soil, water, and waste disposal because these problems will be worse according to the population growth.
- 4) Other important factors affecting environmental management of the TAO i.e. its process on decision making, local politics, and influential groups.

BIBLIOGRAPHY

- American Public Health Association, American Water Works Association and Water Pollution Control Federation. (1998). **Standard Methods for the Examination of Water and Wastewater (20th Edition)**. American Public Health Association, Washington, DC.
- Grimble, R. and Wellard, K. (1996). Stakeholder Methodologies in Natural Resource Management: a Review of Principles, Contexts, Experiences and Opportunities [Online]. Available: <http://www.sciencedirect.com> [2002, June 9].
- Tambon Council and Tambon Administrative Authority Act B.E. 2537 [Online]. Available: <http://www.ipd.ph/logolinkssea/resources/Tambon.pdf> [2004, January 26].
- The Constitution of the Kingdom of Thailand B.E. 2540 (1977) [Online]. Available: <http://www.thailaws.com> [2004, January 26].
- The Enhancement and Conservation of National Environmental Quality Act, B.E. 2535 (1992) [Online]. Available: <http://www.thailaws.com> [2004, January 26].
- The TAO's administrative structure. Available: <http://www.kodmhai.com> [2004, January 26].
- UNDP. (2003). The meaning of good governance [Online]. Available: <http://www.undp.org> [2003, February 27].
- World Bank. (2003). The meaning of good governance [Online]. Available: <http://www.worldbank.org> [2003, February 27].
- กรมพัฒนาชุมชน กระทรวงมหาดไทย. (2541). คู่มือการดำเนินโครงการพัฒนาตำบลปี 2541. กรุงเทพฯ : สำนักเลขาธิการนายกรัฐมนตรี.
- กรมโรงงานอุตสาหกรรม. (2547). บัญชีประเภทโรงงานอุตสาหกรรม ออกตามความในพระราชบัญญัติโรงงาน พ.ศ. 2535 [Online]. <http://www.diw.go.th/factype.html> [2004, December 2].
- กรมโรงงานอุตสาหกรรม และสมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. (2545). ตำราระบบบำบัดมลพิษทางน้ำ. กรุงเทพฯ : สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย.

- กรรณิการ์ สิริสิงห. (2544). **เคมีของน้ำ น้ำไฮโดรเจน และการวิเคราะห์**. กรุงเทพฯ : คณะวิทยาศาสตร์และเทคโนโลยี สถาบันราชภัฏจันทรเกษม.
- เกษม จันทรแก้ว และ ประพันธ์ โกยสมบูรณ์. (2525). **หลักการสิ่งแวดล้อมศึกษา**. (มปท).
- กฤษดา ทองสังวรรณ. (2540). **ความพร้อมของคณะกรรมการบริหารองค์การบริหารส่วนตำบลในการจัดการทรัพยากรธรรมชาติในท้องถิ่น จังหวัดอุดรธานี**. วิทยานิพนธ์ปริญญาศึกษาศาสตรมหาบัณฑิต สาขาวิชาสิ่งแวดล้อมศึกษา บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.
- กองปลูพืชวิทยา กรมวิชาการเกษตร. (2541). **การฟื้นฟูคุณภาพดินและส่งเสริมการปลูกพืชอื่นตามมาตรการรองรับการยกเลิกเลี้ยงกุ้งกุลาดำในพื้นที่น้ำจืด**. กรุงเทพฯ: โรงพิมพ์ชุมนุมสหกรณ์การเกษตรแห่งประเทศไทย จำกัด.
- กองวิเคราะห์ดิน กรมพัฒนาที่ดิน. (2544). **วิธีวิเคราะห์ดินทางเคมี**. (มปท.).
- คณะกรรมการสิ่งแวดล้อมแห่งชาติ. (2537). **กำหนดมาตรฐานคุณภาพน้ำในแหล่งน้ำผิวดิน**. (มปท.).
- งามพิศ สัตย์สงวน. (2545). **สถาบันครอบครัวของกลุ่มชาติพันธุ์ในกรุงเทพมหานคร: กรณีศึกษาครอบครัวไทยโซ่ง**. กรุงเทพฯ : โรงพิมพ์แห่งจุฬาลงกรณ์มหาวิทยาลัย.
- นฤมล เวียงวัง และนันทิยา ก้านสังวอน. (2541). **การแพร่กระจายของความเค็มและการสะสมกำมะถันในดิน ในพื้นที่น้ำจืดบริเวณการเพาะเลี้ยงกุ้งกุลาดำ กรณีศึกษา อ.บางเลน นครปฐม**. โครงการทางวิทยาศาสตร์สิ่งแวดล้อม หลักสูตรวิทยาศาสตรบัณฑิต, สาขาวิทยาศาสตร์และเทคโนโลยีสิ่งแวดล้อม คณะสิ่งแวดล้อมและทรัพยากรศาสตร์ มหาวิทยาลัยมหิดล.
- นาท ต้นทวีรุฬห์ และพูลทรัพย์ สมุทรสาคร. (2528). **วิทยาศาสตร์สิ่งแวดล้อมและการบริหารทรัพยากร**. กรุงเทพฯ : โรงพิมพ์ไทยวัฒนาพานิช.
- นุกูล ชมภูนิช. (2539). **สืบสานวัฒนธรรมและประเพณีชาวไทยโซ่งในประเทศไทย**. นครปฐม: เพชรเกษมการพิมพ์.
- บวรศักดิ์ อูวรรณ โณ. (2542). **การสร้างธรรมาภิบาล (Good Governance) ในสังคมไทย**. เอกสารวิจัยส่วนบุคคล ลักษณะวิชาการเมือง วิทยาลัยป้องกันราชอาณาจักร. (อัครา).
- ประเทือง เชาว์วันกลาง. (2534). **คุณภาพน้ำทางการประมง**. กรุงเทพฯ : ฟิสิกส์เซ็นเตอร์.
- ปริศนา พรหมมา. (2541). **ชุมชนท้องถิ่นกับการจัดการความหลากหลายทางชีวภาพ**. เชียงใหม่ : โครงการพัฒนากลุ่มน้ำภาคเหนือโดยองค์กรชุมชน.
- พจนีย์ มอญเจริญ และชูจิตต์ สงวนทรัพยากร. (2544). **วิธีวิเคราะห์ดินทางเคมี**. มปท.

พระราชกฤษฎีกาว่าด้วยหลักเกณฑ์และวิธีการบริหารกิจการบ้านเมืองที่ดี พ.ศ. 2546 [Online].

http://www.tessaban.com/docement/pdf_file/good1.pdf [2004, January 25].

พีรพัฒน์ โกศลศักดิ์สกุล. (2540). การเปลี่ยนแปลงคุณสมบัติของดินในนาข้าว เนื่องจากการเปลี่ยนแปลงจากระบบเกษตรกรรมเคมีมาเป็นระบบเกษตรกรรมธรรมชาติ. วิทยานิพนธ์ปริญญาวิทยาศาสตรมหาบัณฑิต, สาขาวิชาเทคโนโลยีการบริหารสิ่งแวดล้อม บัณฑิตวิทยาลัย มหาวิทยาลัยมหิดล.

พรศักดิ์ ผ่องแผ้ว และพลศักดิ์ จิรไกรศิริ. (2524). วัฒนธรรมทางการเมืองไทย.

กรุงเทพฯ : โรงพิมพ์แสงรุ่งการพิมพ์.

มหาวิทยาลัยศิลปากร. (2546). โครงการเรียนรู้ร่วมกัน สรรค์สร้างชุมชน ตำบลบางปลา อำเภอบางเลน จังหวัดนครปฐม. (อัครา).

มหาวิทยาลัยสุโขทัยธรรมมาธิราช. (2532). เอกสารการสอนชุดวิชา “พื้นฐานทางสังคมและวัฒนธรรมของการเมืองไทย”. กรุงเทพฯ : ห้างหุ้นส่วนจำกัดภาพพิมพ์.

สถาบันธรรมรัฐเพื่อการพัฒนาสังคมและสิ่งแวดล้อม. (2545). ร่างรายงานฉบับสมบูรณ์ โครงการธรรมาภิบาล (Good governance) และการมีส่วนร่วมของประชาชน (Public participation) ในกระบวนการจัดการด้านสิ่งแวดล้อม. (อัครา).

สถาบันพระปกเกล้า. (2544). ตัวชี้วัดธรรมาภิบาล. กรุงเทพฯ : สถาบันพระปกเกล้า.

----- (2544). การจัดอันดับองค์กรปกครองส่วนท้องถิ่นที่เข้าร่วมโครงการรางวัลพระปกเกล้า ประจำปี 2544. (อัครา).

สถาบันสิ่งแวดล้อมไทย สถาบันพระปกเกล้า และสำนักงานคณะกรรมการประสานงานองค์กรพัฒนาเอกชน. (2545). ธรรมาภิบาลที่วัดได้ ตัวชี้วัดการมีส่วนร่วมของประชาชนในการจัดการสิ่งแวดล้อม. กรุงเทพฯ : บริษัทไทยกราฟิคแอนด์พริ้นท์ จำกัด.

สาขาเทคโนโลยีการบริหารสิ่งแวดล้อม รุ่น 27 คณะสิ่งแวดล้อมและทรัพยากรศาสตร์ มหาวิทยาลัยมหิดล. รายงานการฝึกภาคสนามครั้งที่ 3 การศึกษาเพื่อประเมินความเสี่ยงที่มีผลต่อสุขภาพของชาวนา และผลกระทบที่มีต่อสิ่งมีชีวิตในพื้นที่นาข้าว จากการใช้สารเอนโดซัลแฟน: กรณีศึกษา บ้านสระ ต.บ้านสระ อ.สามชุก จ.สุพรรณบุรี. (อัครา).

สุนันท์ จำรูญพานิชย์กุล. (2544). การมีส่วนร่วมขององค์กรปกครองส่วนท้องถิ่น 5 แห่งในการจัดการสิ่งแวดล้อม โดยมีองค์การบริหารส่วนจังหวัดนครสวรรค์เป็นผู้ประสานงาน. เอกสารวิชาการส่วนบุคคล สถาบันพระปกเกล้า.

- เสาวภา พรศิริพงษ์ และคณะ. (2545). **โครงการศึกษาประวัติศาสตร์วัฒนธรรมท้องถิ่นภาคกลาง
ชุมชนลุ่มน้ำนครชัยศรี พัฒนาการทางประวัติศาสตร์ เศรษฐกิจ สังคมวัฒนธรรม พลวัต
และการทำทนาย. (อัครา).**
- สำนักงานอำเภอบางเลน. (2544). **บรรยายสรุปอำเภอบางเลน จังหวัดนครปฐม. (อัครา).**
- สำนักงานคณะกรรมการป้องกันและปราบปรามการทุจริตแห่งชาติ, สำนักงานคณะกรรมการ
ข้าราชการพลเรือน และสถาบันวิจัยเพื่อการพัฒนาประเทศไทย. (2543). **สังคมโปร่งใสไร้
ทุจริต กลุ่มที่ 3 ความโปร่งใสและการป้องกันการทุจริตคอร์รัปชันในระดับท้องถิ่นและ
ชุมชน. เอกสารประกอบการสัมมนาวิชาการประจำปี วันที่ 18-19 พฤศจิกายน 2543.**
- เอเจอร์ แซม แบลและ เรียบเรียงโดย ไชยวัฒน์ คำชูและคณะ. (2545). **ธรรมาภิบาล : การบริหาร
การปกครองที่โปร่งใสด้วยจริยธรรม. กรุงเทพฯ : สำนักพิมพ์น้ำฝน.**
- อรพินท์ สฟโชคชัย และคณะ. (2543). **โครงการศึกษารูปแบบและแนวทางการส่งเสริมความ
เข้มแข็งขององค์การบริหารส่วนตำบลระยะที่สอง. (มปท).**



APPENDIX A
WATER SAMPLES ANALYSIS RESULTS
(Samples were collected on 30th August 2003)

Table A-1 Surface water analysis results

stations	Sample sites Places	time	Temp (°C)		pH	Conductivity µmhos/cm	Depth (m.)	Transparency (m.)	Salinity (ppt.)	Note
			Air	Water						
S1	Thachin river before merging with Thasan canal	9.35	30.0	30	6.90	310	10.40	0.45	0	
S2	In front of Bangpla temple	10.00	30.0	30	7.15	289	6.85	0.45	0	
S3	The beginning of Bang Hwai canal	12.30	35.0	32	6.88	780	1.00	0.45	0	
S4	The end of Bang Hwai canal	14.05	36.5	32	7.52	255	0.80	- *	0	Collected by dip up
S5	The beginning of Ar-Ma canal	15.20	36.0	32	7.44	550	1.00	0.35	0	
S6	The end of Ar-Ma canal	17.00	34.5	32	7.38	405	0.95	0.35	0	
S7	The beginning of irrigation canal	15.43	35.0	31	7.90	140	1.20	0.55	0	
S8	The middle of irrigation canal	14.30	37.0	32	7.48	225	1.40	0.55	0	
S9	The end of irrigation canal	13.45	34.0	32	7.95	230	0.90	0.48	0	
S10	Donkhamin canal	16.05	36.0	32	7.16	750	2.10	0.53	0	
S11	Kao Rat market canal	16.30	34.0	31	7.25	500	1.00	0.45	0	
S12	The beginning of Thasan canal	17.55	32.0	31	7.46	340	3.81	0.39	0	
S13	The middle of Thasan canal	17.30	32.5	31	7.40	368	2.87	0.38	0	
S14	The end of Thasan canal	11.08	32.0	31	6.78	387	3.18	0.35	0	
S15	The beginning of Saingam canal	18.40	30.0	30	7.45	400	2.00	0.35	0	
S16	The end of Saingam canal	18.15	29.9	30	7.46	372	1.40	0.35	0	

Table A-2 DO and BOD analysis results by Azide Modification Method

STATIONS	SAMPLE SITES		DO Ex. 1 (mg/l)	DO Ex. 2 (mg/l)	Average DO (mg/l)	BOD aver. Ex. 1 (mg/l)	BOD aver. Ex. 1 (mg/l)	Average BOD (mg/l)	Note
	PLACES								
S1	Thachin river before merging with Thasan canal		1.10	1.10	1.10	1.22	1.57	1.40	
S2	In front of Bangpla temple		1.30	1.35	1.33	4.08	3.87	3.98	
S3	The beginning of Bang Hwai canal		2.00	1.80	1.90	3.86	3.62	3.74	
S4	The end of Bang Hwai canal		6.60	6.50	6.55	1.51	1.80	1.66	
S5	The beginning of Ar-Ma canal		6.20	6.30	6.25	4.43	4.05	4.24	
S6	The end of Ar-Ma canal		7.15	7.35	7.25	3.59	4.45	4.02	
S7	The beginning of irrigation canal		8.70	8.60	8.65	0.68	0.75	0.72	
S8	The middle of irrigation canal		8.20	8.00	8.10	1.60	1.33	1.47	
S9	The end of irrigation canal		8.50	8.30	8.40	0.89	1.12	1.01	
S10	Donkhamin canal		1.40	1.50	1.45	2.01	2.53	2.27	
S11	Kao Rat market canal		2.30	2.30	2.30	2.51	2.86	2.69	
S12	The beginning of Thasan canal		5.70	5.60	5.65	1.45	1.69	1.57	
S13	The middle of Thasan canal		5.40	5.30	5.35	-	2.23	2.23	DO was error
S14	The end of Thasan canal		4.50	4.50	4.50	2.31	2.38	2.35	
S15	The beginning of Saingam canal		5.55	5.30	5.43	2.49	1.80	2.15	
S16	The end of Saingam canal		4.10	4.90	4.50	2.11	2.03	2.07	

Table A-3 Ground water samples analysis results

(The samples were collected on September 2003)

Parameters sampling sites	Salinity (ppt.)	pH	F	Note
Moo 1	0	7.92	1.90	Consumption water
Moo 2	0	8.69	1.80	Consumption water
Moo 3	3	7.38	0.75	Consumption water
Moo 3	0	8.33	-	Drinking water
Moo 4	0	8.71	2.54	Consumption water
Moo 5	0	8.79	2.30	Consumption water
Moo 6	0	7.92	2.11	Consumption water
Moo 7	1	7.77	2.48	Consumption water
Moo 8	0	7.69	1.07	Consumption water
Moo 9	0	7.90	1.72	Consumption water
Moo 10	0	7.54	0.94	Consumption water
Moo 11	0	7.69	1.88	Consumption water
Moo 12	0	7.63	2.86	Consumption water
Moo 13	0	7.95	1.15	Consumption water
Moo 14	0	7.61	1.88	Consumption water
Moo 15	-	-	-	In process, now they share with Moo 12

APPENDIX B

SOIL SAMPLES ANALYSIS RESULTS

The procedures for pH analysis can be shown as follow:

soil: water by the 1 : 1 (V/V)

- 1) Weigh 10 grams of soil in a 50 ml. Beaker.
- 2) Add 10 ml. of distilled water. Stir the resulting suspension several times.
- 3) Let the suspension to stand undisturbed for about 30 minutes to allow most of the suspended clay to settle out.
- 4) Take the suspension to measure pH by pH meter which already standardize with pH 7 and 4.

The procedures for soil salinity analysis

soil: water by the 1 : 5 (V/V)

Soil was extracted and measured by the Electrical Conductivity: EC. The procedures can be shown as follow:

- 1) Scoop 10 grams of dried, sieved soil into the 125 ml erlenmeyer flasks.
- 2) Add 50 ml distilled water and stir thoroughly 30 minutes then allow the suspension to equilibrate for over night.
- 3) Take the filtrate to measure EC by Conductivity meter.
- 4) Warm up conductivity meter 15 minutes at 25 °C.
- 5) Standardize the conductivity meter using the standard KCl solution following manufacturer's instructions. Set the temperature compensation dial on the conductivity meter to the temperature of the extract.
- 6) Measure the temperature of the extract at 25 °C.
- 7) Rinse the conductivity cell, fill with the soil extract and then read the electrical conductivity of the saturated paste extract in mmhos cm⁻¹. If temperature

compensation is not an option on the meter, adjust conductivity reading to 25 °C to ensure correct interpretation.

8) The results can be used for soil salinity assessment by using correlation curve with soil saturation extraction (Theumrat, 2000 cited in Moncharoen, 2001).

The results can be shown as follow:

The results of pH and EC was showed in Tables B-1 and B-2 respectively. The EC results by the 1:5 (V:V) which was a simple method that used in this study then compared with soil saturation extract method by correlation curve. The comparative will lead to total EC which can be shown in Table B-3.

Table B-1 pH analysis results

STATIONS	pH											
	Replication 1				Replication 2				Average			
	3	10	20	100	3	10	20	100	3	10	20	100
1. Control 1	6.27				6.28				6.54			
2. Control 2	6.70				6.70				6.70			
3. Shrimp farm M 6	7.13	6.97	6.75	6.54	7.13	7.00	6.72	6.50	7.13	6.99	6.74	6.52
4. <i>Penaeus monodon</i> farm M 15	6.08	6.34	5.91	6.40	6.07	6.34	5.93	6.35	6.08	6.34	5.92	6.38

Table B-2 Electrical Conductivity: EC results

STATIONS	Conductivity (mmho/cm)											
	Replication 1				Replication 2				Average			
	3	10	20	100	3	10	20	100	3	10	20	100
1. Control 1	0.88				0.80				0.84			
2. Control 2	0.22				0.25				0.24			
3. Shrimp farm M. 6	1.05	0.20	0.15	0.14	0.69	0.22	0.10	0.15	0.87	0.21	0.13	0.15
4. <i>Penaeus monodon</i> farm M 15	1.52	0.95	1.60	1.52	1.70	1.75	1.70	1.30	1.61	1.35	1.65	1.41

Table B-3 Soil salinity results from correlation curve

STATIONS	Electro Conductivity: EC (dS/m)		
	3 m	10 m	100 m
1. Control 1	9.815		
2. Control 2	6.748		
3. Shrimp farm M 6	9.969	6.594	6.185
4. <i>Penaeus monodon</i> farm M 15	13.752	12.423	13.956
			6.288
			12.729

APPENDIX C

SOIL SALINITY LEVEL AND ITS IMPACT TO PLANTS

TABLE C-1 Degree of salinity, classified by Electrical Conductivity (EC) which was measured by soil saturation extract and its impact to plants.

Salinity level	EC (dS/m)	salt (%)	Impacted to plants	The example plants
1. Non- saline	< 2	< 0.1	Non -affected	Average plants have normal productivity.
2. Slightly saline	2 - 4	0.1 – 0.15	Impacted to non-salt tolerant plant	Bean, cucumber, chinese cabbage, pepper.
3. Moderately salinity	4 – 8	0.15 – 0.35	Impacted to many plants	Rice, corn, pine apple, cassava.
4. Strongly saline	8 – 16	0.35 – 0.70	Only salt tolerant plant can grow	Kale, swamp cabbage, asparagus, spodilla, rose apple, guava, tammarine, coconut, jujube.
5. Very strongly saline	> 16	> 0.70	Little kinds of salt tolerant plant can grow	Avicennia sp. and Rhizophora sp.

Source: Soil Science Division, Department of Agriculture (applied from Arunin,1993)

APPENDIX D
LIST OF STAKEHOLDER

NAME	CAREER / POSITION	ORGANIZATION
1. Mr. Samran Hongmatcha	Head of the TAO	Moo 1
2. Mr. Phakphum Thanagetphisan	Assistant head of the TAO	Moo 10
3. Mr. Kritsana Noiluangchai	Chairman, Council of the TAO	Moo 11
4. Mr. Winai Srichainat	Assistant chairman, Council of the TAO	Moo 4
5. Mr. Manat Sirinaphothi	Secretariat of The TAO	Moo 12
6. Mr. Somyot Chaiya	Committee, Council of TAO	Moo 1
7. Mr. Tui Lamunmon	Committee, Council of TAO	Moo 2
8. Ms. Mariam Munthongniam	Committee, Council of TAO	Moo 2
9. Mr. Phairot Wetaphon	Committee, Council of TAO	Moo 3
10. Mr. Wichian Sunthonmatcha	Committee, Council of TAO	Moo 5
11. Mr. Thung Mekon	Committee, Council of TAO	Moo 7
12. Mr. Ruam Phetaen	Committee, Council of TAO	Moo 8
13. Mrs. Sanit Iamkhong	Committee, Council of TAO	Moo 9
14. Mr. Chakraphan Thannop	Committee, Council of TAO	Moo 13
15. Mr. Phua Chanthongklot	Committee, Council of TAO	Moo 13
16. Mr. Sarawut Phet-aen	Committee, Council of TAO	Moo 14
17. Mr. Watsana Phetrun	Assistant Kamnan	Moo 11
18. Mrs. Wipha Suthithev	Head of village	Moo 1
19. Mr. San Lamunmon	Head of village	Moo 2
20. Mrs. Phonthip Rodsamran	Head of village	Moo 3
21. Mr. Phon Intharaphong	Head of village	Moo 4
22. Mr. Somwang Klamrat	Head of village	Moo 5
23. Mr. Chathurong Hmuanprasat	Head of village	Moo 6
24. Mr. Phaeo Chanthongklot	Head of village	Moo 7
25. Mr. Suchin Chaiyoyodying	Head of village	Moo 8

NAME	CAREER / POSITION	ORGANIZATION
26. Mr. Kriangwit Wiriyahiranphibun	Head of village	Moo 10
27. Mr. Samai Mithawon	Head of village	Moo 13
28. Mr. Ruan Phet-aen	Assistant head of village	Moo 14
29. Ms. Thipawan Phetsamian	Assistant head of village	Moo 15
30. Mr. Chaiyut Phomyaemyai	Irrigation officer	Tambon Bangpla Irrigation Office
31. Mr. Somsak Chamram	Irrigation officer	Tambon Bangpla Irrigation Office
32. Mr. Chukiat Pathomkamnoed	Public Health Officer	Tambon Bangpla Public Health Office
33. Mr. Witsanu Thapsuthi	Mobile Unit	Land Development Department
34. Mr. Suchat Meksanga	Rice farmer	Moo 3
35. Mr. Prawat Phengrungruangwong	Gardener	Moo 10

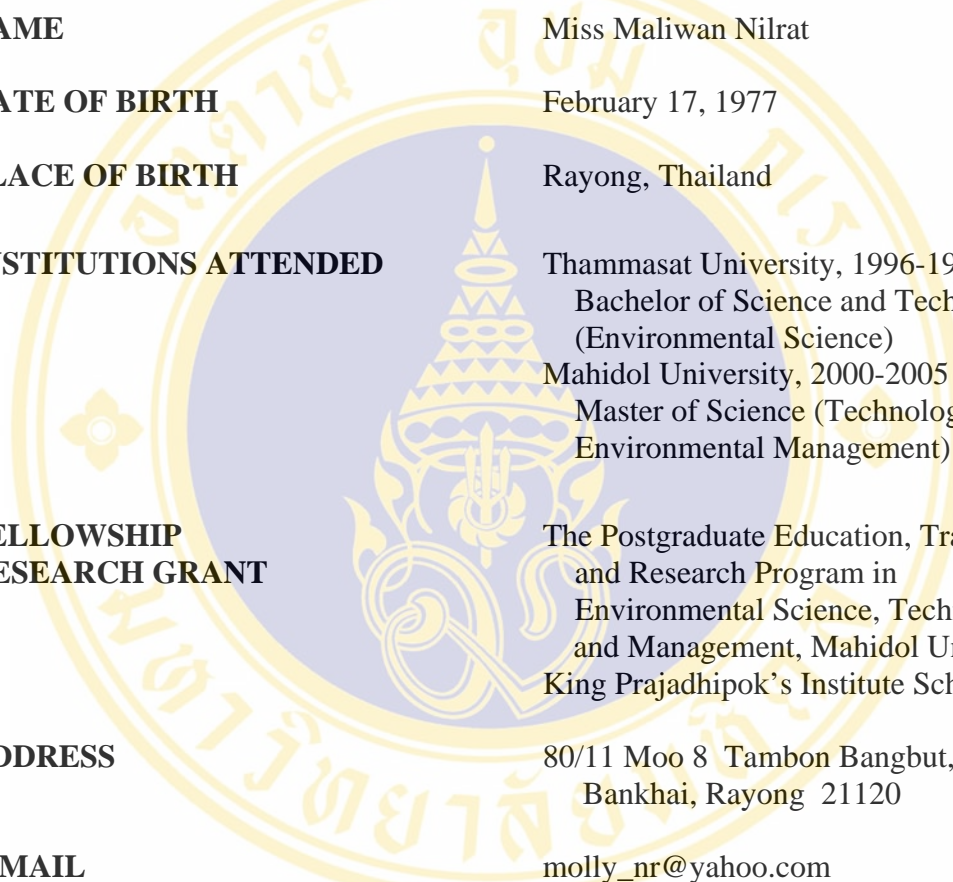
APPENDIX E
QUESTIONS GUIDELINE IN INDEPTH INTERVIEW

QUESTION GUIDELINES	STAKEHOLDERS
<p>1) Attitude on environmental problem.</p> <ul style="list-style-type: none"> - Did the TAO concern about environmental problem? Are there environmental monitoring system? -What is the most important environmental problem in this area? - How did the TAO deal with environmental problem? - Did the TAO apply good governance in environmental management? Is it work? 	<ul style="list-style-type: none"> * Tambon Administrative Authority deputy
<ul style="list-style-type: none"> - The comparative soil and water quality between the past and present? - What is the first priority of environmental problem? - what are the impacts from water and soil problem? - What is the main cause of water/environmental problem in your perception? - Before changing to shrimp farm, What are the land used for? - where is the source of consumption water? - Are there any problems by the time irrigation canal was closed? and how about the water quality? 	<ul style="list-style-type: none"> * Private sector - who own business in trading and rice mill. * Local people - rice farmer, gardener and shrimp farmer.
<ul style="list-style-type: none"> - How about an existing environmental condition in Tambon Bangpla? - Are there severe environmental problems in your community? - What is an important problem? - Did Black Tai have a traditional to conserve soil and water? 	<ul style="list-style-type: none"> * Kamnan, Head of village

QUESTION GUIDELINES	STAKEHOLDERS
<ul style="list-style-type: none"> - Do you think social sanction was suitable than regulation? - who is an important stakeholder in environmental management? - Where are the area that soil and water samples should be collected? -The comparative soil and water quality between the past and present? -What is the majority career of local people? Did they still do shrimp farm? -What was the impact of giant tiger prawn farming? - After gave up shrimp farming, what did they do? 	
<p>2) The TAO administration</p> <ul style="list-style-type: none"> - What are the duties and roles of the TAO in environmental management? - Does the TAO apply good governance in its administration? - How do you think about good governance? - As a results of environmental quality, it was over the standard limit, Did the TAO concern about it and how to solve such problem? - What is the environmental problem in your perception and the degree of severe? - How about the long term plan of the TAO and prioritize? - What is a main impediment in administration? 	<p>* Local Administrative Organizations and the TAO</p>
<ul style="list-style-type: none"> - Did the TAO keep people informed of their participation and rechecking their work for transparency? - Have the TAO ever run the campaign on environmental management in your community? - The comparative management in environmental problem between pre and post has the TAO? Did it has better problem control? 	<p>* Local people, Kamnan, Head of village</p>

QUESTION GUIDELINES	STAKEHOLDERS
<p>3) Private sector manufacturing</p> <ul style="list-style-type: none"> - How about the processes and production/day of your firm? - How about waste treatment system? - Where is the source of water supply? -How did your firm deal with waste water? - What is the problem in your firm? - Have your firm ever been claimed by community? - How to deal with environmental problem in your firm? - Did public sector help to solve such problem? 	<ul style="list-style-type: none"> * Private sector - Factory, rice mill

BIOGRAPHY



NAME	Miss Maliwan Nilrat
DATE OF BIRTH	February 17, 1977
PLACE OF BIRTH	Rayong, Thailand
INSTITUTIONS ATTENDED	Thammasat University, 1996-1999 Bachelor of Science and Technology (Environmental Science) Mahidol University, 2000-2005 Master of Science (Technology of Environmental Management)
FELLOWSHIP RESEARCH GRANT	The Postgraduate Education, Training and Research Program in Environmental Science, Technology and Management, Mahidol University King Prajadhipok's Institute Scholarship
ADDRESS	80/11 Moo 8 Tambon Bangbut, Amphoe Bankhai, Rayong 21120
E-MAIL	molly_nr@yahoo.com