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PARTICIPATORY AQUATIC ANIMAL RESOURCE MANAGEMENT OF FRESHWATER FISHING COMMUNITIES: A CASE STUDY OF HADPANA COMMUNITY, AMPHOE SI SAWAT, CHANGWAT KANCHANABURI

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A Thesis Submitted in Partial fulfillment of the Requirements
for the Degree of Master of Arts Program in Thai Studies
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อ. ที่ปรึกษา: ดร. นฤมล อรุโณทัย จำนวนหน้า 162 หน้า.

งานวิจัยครั้งนี้มีวัตถุประสงค์คือ 1. ศึกษากลไกที่ทำให้การจัดการทรัพยากรสัตว์น้ำอย่างมีส่วนร่วมประสบความสำเร็จ 2. ศึกษาปัญหาและอุปสรรคที่ส่งผลต่อกระบวนการพัฒนาการจัดการทรัพยากรอย่างมีส่วนร่วมของชุมชนประมงที่เพิ่งก่อตั้ง 3. เสนอแนะแนวทางในการจัดการทรัพยากรอย่างยั่งยืนในอนาคต งานวิจัยนี้เป็นการศึกษาวิจัยเชิงคุณภาพ ดำเนินการเก็บข้อมูลโดยการสังเกต, การสัมภาษณ์แบบกึ่งโครงสร้างและการสัมภาษณ์แบบเจาะลึก

การจัดการทรัพยากรสัตว์น้ำอย่างมีส่วนร่วมของชุมชนหาดปานาซึ่งเป็นชุมชนที่เพิ่งก่อตั้งใหม่นั้นมีความแตกต่างจากชุมชนประมงอื่นๆที่ก่อตั้งมาเป็นเวลานานตรงที่ชุมชนหาดปานานั้นไม่ได้ใช้ความรู้ท้องถิ่นที่มีรากฐานอยู่กับวัฒนธรรมความเชื่อดั้งเดิมร่วมกันมาเป็นกลไกที่ทำให้การจัดการนั้นเป็นไปอย่างมีประสิทธิภาพ หากแต่ชุมชนหาดปานากลับใช้การจัดการที่ตั้งอยู่บนฐานของผลประโยชน์ร่วมกันของสมาชิกในชุมชนเพื่อจัดระเบียบความสัมพันธ์ระหว่างมนุษย์กับทรัพยากร

ผลการศึกษาพบว่า กลไกที่ทำให้การจัดการทรัพยากรสัตว์น้ำของหาดปานาประสบความสำเร็จได้นั้นประกอบไปด้วย กลไกภายในและภายนอกชุมชน กลไกภายในชุมชนประกอบด้วย 1. การควบคุมทางสังคมโดยการบังคับใช้กฎ กติกา มารยาทในการจัดการทรัพยากรสัตว์น้ำที่สมาชิกของชุมชนยอมรับและปฏิบัติตามเนื่องจากเป็นสิ่งที่ชาวบ้านกำหนดขึ้นมาจากความรู้ที่มีอยู่ของชุมชนนั้นเอง 2. ผู้นำชุมชนที่เข้มแข็ง 3. การสร้างองค์กรชุมชนที่เข้มแข็งด้วยความสามัคคีและตั้งใจจริงของชาวบ้าน ส่วนกลไกภายนอกประกอบด้วย 1. ความร่วมมือระหว่างชาวบ้านและเจ้าหน้าที่กรมประมงที่ทำงานโดยเข้าใจทั้งหลักการของการจัดการทรัพยากรสัตว์น้ำอย่างมีส่วนร่วมและลักษณะของชุมชนจึงทำให้ความร่วมมือเป็นไปอย่างมีประสิทธิภาพ 2. แรงกดดันภายนอกจากการลงโทษผู้ละเมิดกฎและการบังคับให้ย้ายออกนอกพื้นที่ในอดีตส่งผลให้ชาวบ้านทำตามกฎและให้ความร่วมมือในการจัดการเป็นอย่างดีด้วยความกลัวว่าหากไม่ทำตามจะส่งผลในทางลบต่อการทำมาหากินของตนเอง

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KEYWORDS : PARTICIPATORY RESOURCE MANAGEMENT / FRESHWATER FISHING COMMUNITY / HADPANA COMMUNITY / AQUATIC ANIMAL RESOURCE MANAGEMENT / SRINAKARIN RESERVOIR

NUTTAPOL SOTHIRATVIROJ: PARTICIPATORY AQUATIC ANIMAL RESOURCE MANAGEMENT OF FRESHWATER FISHING COMMUNITIES: A CASE STUDY OF HADPANA COMMUNITY, AMPHOE SI SAWAT, CHANGWAT KANCHANABURI. THESIS ADVISOR : NARUMON ARUNOTAI, PH.D., 162 pp.

The objectives of this research are 1. to study mechanisms which facilitate participatory management of a community's aquatic animal resources 2. to analyze problems and obstacles in the process of developing participatory resource management in a newly-settled community 3. to propose recommendations for future sustainable resource management of a community. This research is a qualitative study that collected data by observation, semi-structured interviews and in-depth interviews.

The participatory aquatic animal resource management of Hadpana community, which is a newly settled community, is unique in the sense that the community does not draw upon common traditional knowledge as a mechanism to manage the resource effectively, but utilizes management based on common benefits of the community's members to manage the relationships between humans and resources.

This research finds that the mechanism creating the successful resource management of Hadpana community consists of internal and external mechanisms. The internal mechanisms are: 1. the social control by using regulations and courtesy which is created and accepted by community members to manage the resources 2. the strong leadership 3. the strong community organization constructed from unity and determination of villagers. The external mechanisms are 1. the mutual operations between villagers and the Department of Fisheries officers who understand both the principles of participatory aquatic animal resource management and the unique features of the community 2. the external pressure to follow regulations due to the fact that the punishment of breaking regulations, including expulsion from the area, causes villagers to follow regulations and co-operate in the resource management effectively.

Field of Study : Thai Studies

Academic Year 2009

Student's Signature .....

Advisor's Signature .....

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CHAPTER I

INTRODUCTION

1.1 Background and importance of the research problem

The problems regarding conflicts over resource management in Thailand are consistently increasing; moreover, the trends and elements of these problems are becoming subsequently more complex and crucial. Studies in this field have therefore been of great interest to Thai scholars, particularly within the last ten years (Anan 2000: 285). However, even with the growing interest in, and importance of, these problems, many issues still persist and there has been no given solution or result put in to practice at this time. Initially, studies regarding conflicts over resource management focused primarily on the incapability of the Thai state to establish a set of knowledge that could be adapted to more complex situations. Over the past few decades, the Thai state has had to rely on western sciences and technologies as the mainstream paradigm utilized to regard these issues. This resulted in the implication of standards that overlooked and neglected the importance of the community's potential to manage natural resources.

One of the factors contributing to the problem is "development;" this development system resulted in the destruction of many natural resources and the environment of this country. The failures of mainstream development and the increasing deterioration of the environment attracted interest in natural conservation by both NGOs and the government. Rights to manage natural resources thus became the primary issue for the research field and the main approach for further studies. Currently, there has been an attempt to propose a new way of natural resource management through creating a new set of knowledge countering the mainstream way of thinking established by the Thai state, one which focuses on the rights of a community to participate in resource management of its own area. The focus towards a community's participation in management of natural resources and law establishment was widely discussed for a long time, and finally the concept of

Community Rights was put in practice as article 66 and 67 of the Thai constitution B.E. 2550 which are:

Article 66 “Persons living together as a local community have the right to conserve and revive customs, intellectuals, arts and cultures of both local and nation. They also have the right to participate in management, maintenance, and use of natural resources in the way of equilibrium and sustainability.”

Article 67 “Rights of persons to participate with the state and community to conserve, maintain, and use from natural resources and biodiversities, and to protect, support, and maintain environmental quality for living normally in an environment which does not harm the health or quality of life must be protected appropriately.
Any project or activity that may negatively affect the environment, natural resources, or health of residents shall not be performed unless the studies of the environmental consequences and health impact have been done and the forum to consult with those so affected has firstly been established. Moreover, independent organizations such as NGOs focusing on the environment and public health, and representatives from universities studying the environment, natural resources, and public health must give their opinions before the process begins.

Rights of a community to make a prosecution to any governmental service, state organization, government enterprise, or any state units which are a juristic entity to perform any duty on this article must be protected.”
(Office of the Council of State of Thailand)

As the best alternative at present, resource management based on communal participation is increasing considerably in all ecosystems facing the decay of resources. The aquatic animal resource management in both wetland and coastal ecosystems also falls under the influence of this stream. In the case of Thailand, aquatic animals are a very prominent source of protein for the people. As the country’s population is increasing, the demand for resources is further augmented; however, the stock of resources will undoubtedly drastically decrease when technology provides for more effective fishing gear. Over-fishing is emerging in all fishing areas in response to the need to catch large numbers of fish in order to meet demands; the result of these actions is a crisis to the quantity of aquatic animals in the natural waters. However, fisheries are not the only factor contributing to this critical

problem of the decreasing stock of aquatic animal resources; water pollution caused by human activities is another significant component of the problem, as it has been destroying the habitats of the animals for a long time. Though the stakeholders, especially the Department of Fisheries, intended to prevent and solve this problem through law enforcement and governmental management, their efforts have not been successful in practice. The yield of fisheries is continuously decreasing. According to the fisheries management section of the Department of Fisheries, the main cause of the failure is the lack of co-operation in management from the fishing communities. This is due largely to the fact that, in the past, the general understanding of fishermen was that the management and maintenance of aquatic animals in natural waters fell under the responsibility of the state only (Department of Fisheries as the representative); fishermen just used the resources (Fisheries Management Department 2008).

The Department of Fisheries, therefore, operated under the belief that the key to success in solving the over-fishing and water pollution problems must lie within the fishing community itself. The Department began creating projects to manage aquatic animal resources based on the fishing communities in both freshwater and saltwater areas. In the case of the saltwater fisheries, the Department of Fisheries planned to distribute resource management in the way of TURFS (Territorial Use Rights in Fisheries) and control the use of fishing boats; this second plan was used particularly for huge commercial fisheries from 1990 onwards and there has been substantial research conducted on these situations consecutively (Santita 2000: 282-288).

In the case of freshwater fisheries, the fisheries management section of the department established a project called “The establishment of a model fishing community project” in order to solve long-term problems regarding the management of aquatic animal resources. The main objectives of the model fishing community project are:

1. To establish fishing communities that can strongly manage aquatic animal resources.
2. To establish model-fishing communities in aquatic animal resource management that could be extended as models to other fishing communities.

This project began in 2006 and up until now (2009), has planned to establish at least 25 communities in chosen areas around the country which are considered to

have both the potential of space and community for aquatic animal resource conservation within 2009. The project operates under the responsibility of 25 units of the fisheries patrol who survey and analyze a community in their responsible areas in order to establish that community as a model fishing community[1] (Fisheries Management Department 2008).

According to the project's objectives, the practical purpose of this project is to establish a fishing community capable of managing aquatic animal resources effectively in order to maintain sustainable aquatic animal resources. This will allow state units (especially, the Department of Fisheries) the opportunity to alter their roles to be facilitators in academic issues and assist only in necessary situations instead of being commanders and law enforcers in a top-down policy approach towards aquatic animal resource management. The fishing communities therefore hold the most important role in the project since they earn their rights to manage the resources in the area legally. The transformation of the aquatic animal resource's status from public property, which is free access to anyone, to communal property, which belongs only to the local community, is the essence of the participatory aquatic animal resource management that gives rights to local fishing communities to participate in the resource management. Community rights to manage aquatic animal resources in fishing communities therefore becomes the principle nucleus of the process aimed at rehabilitating and maintaining resources in an ecosystem for sustainable fishing in Thailand.

Hadpana community is a chosen community within this project. The community is located in the upper northern area of the Srinakarin or Chao Nen Lake, which is a reservoir over the Srinakarin Dam. The area where the community is located is considered to be the northern most community situated on the lake, as the area beyond the community is surrounded by only water and a western forest complex that expands from Tak in the north of Thailand. The wilderness of the area provides an abundance of aquatic animals originating from the water source of the Mae Klong River, which runs through Thung Yai Naresuan World Heritage in Uthai Thani to many isles over the Ong Thang wildlife checkpoint, the end of the fisheries area,

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[1] See the details of the establishment of model-fishing community project in Appendix II

which fishermen have referred to as the spawning grounds of aquatic animals (Nit, interview 26 February 2009). Moreover, various kinds of aquatic animals including rare fish species, like the Mekong giant catfish (*Pangasianodon gigas*), Seven striped barb (*Probarbus Jullieni*), and Kanburien giant soft-shelled turtle (*Chitra Chitra)*[2] are found in abundance in this wetland ecosystem.

The plentifulness of the area attracted many people to settle in the area following the flooding that followed the dam's construction, but most of them settled temporarily and established fisheries in the area. At present, there are only 28 households of about 74 habitants settled in the area, and there is no permission or allowance for further settlement. Moreover, the area of Hadpana is currently a restricted area not allowing any other fishermen to operate any kind of fishery; only the villagers are permitted to operate fisheries under the rules and regulations created and accepted by the community in order to limit the number of captures. Furthermore, Hadpana area is considered to be a water source of the Srinakarin reservoir; therefore, if there were a limited number of aquatic animals in the north end of the reservoir, which is the water source, the animals migrating to the south of the reservoir would be fewer. This chain reaction would affect a large number of people living in the vicinity of the Srinakarin reservoir.

Apart from its potential of space allowing for high fisheries stock, Hadpana has not only biodiversity of aquatic animal resources, but also ethnic diversity. The area is populated with Thai people from many various ethnic backgrounds such as: Mon, Thai Yai, Karen and some of whom are stateless people. Due to the minimal length of establishment of the community, as of now still less than 30 years, and the fact that there were people moving around the community in the past before the community was officially settled, there exists a fear that people's different perspectives towards resource management could create problems for the project. According to the report by CODI (Community Organizations Development Institute) 2008, it is stated that the wetland resource management by the local community requires two different knowledge systems, which are:

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[2] In Thai called "Taparb Man Lai", the largest soft-shelled turtle in the world. It is very rare and at risk of extinction as it is found only in Kwai and the Mae Klong river in Kanchanaburi; therefore, CITES listed its name on the II list.

1. The traditional knowledge system: i.e. beliefs and rituals passed down from ancestors. This knowledge system is structured around management according to Buddhism, animism, and local customs. The objective is to construct consciousness and allow for participation of people in the community.

2. The knowledge system of utility: This knowledge system focuses on the use of the community's productive system in conditions of culture, productive systems, systems of values, the use of the ecosystem and biodiversity within the wetland area, and the development of communal organization.

Due to its very short age of settlement and ethnic diversity, Hadpana fishing community, like many communities in reservoirs over dams[3], is unable to construct a traditional knowledge system due to the fact that villagers are all new-comers to the area and do not have a unified background or knowledge system inherited from a common origin and ancestor. This characteristic differs greatly from the concept of participatory aquatic animal resource management in other areas of Thailand where many fishing communities (especially those near such rivers as the Mae Mun, Yom, Mekong, and the coastal fishing communities) have existed in the area for long periods of time. These communities successfully manage their resources under their traditional knowledge systems i.e. traditional knowledge frameworks, beliefs, customs, and rituals that have highly influenced the way communities use and manage their resources. Hadpana community is unable to utilize this type of knowledge system because of its multiculturalism that does not share a unified cultural root. Traditional knowledge system thus does not pertain to the aquatic animal resource management of the Hadpana community. Despite the lack of a traditional knowledge base transmitted over time, Hadpana community developed its own mechanisms and methods to manage aquatic animal resources in the area effectively based on the concept of the common interests of villagers in the community, the consequences of

[3] Remarkably, almost all communities under this project are fishing communities located inside the area of a reservoir over a dam and are newly established within the last 40 years; they share some characteristics to each other such as the living styles of the community and the variety of ethnicities amongst those who comprise the community.

which in practice seem to have had positive effects according to the criteria of the Department of Fisheries (Waipot, interview 25 February 2009).

One of the most important aspects of uncertainty within the Hadpana fishing community's aquatic resource management is that of how the community can construct a mechanism and collective understanding amongst fishermen in order to effectively manage the resources in their own way. This research thus tends to study mechanisms and methods used in aquatic animal resource management of communities who do not have a collective traditional knowledge system to draw upon, but have nonetheless had effective positive outcomes in practice. Moreover, this research will identify and analyze problems and obstacles in the process of developing participatory aquatic resource management to establish a model fishing community, Hadpana community, in order to represent the current situation and consequences of the project on both resources and the community itself.

Figure 1.1: Kanchanaburi Map

(Source: http://www.bookingtothailand.com/kanchanaburi.html)

The trend of natural resource management in Thailand relies mainly on the participation of the community in order to create its own set of knowledge for managing resources, and the use of that paradigm as a framework to manage natural resources within its area. In order to effectively understand a community it is necessary to consider the integrated knowledge of each area, which has particular characteristics of its own. Currently, there are very few studies concerning the participatory aquatic animal resource management of newly settled freshwater fishing communities, e.g. Waraporn's work on the management of sustainable fisheries in the area of the reservoir over Ubonrat Dam. Studies of this pattern on fishing communities are therefore necessary for the field, which lacks this kind of aquatic animal resource management at this time.

Hence, the case of Hadpana fishing community is not only interesting, but also imperative to study as it embodies its own characteristics as a model fishing community where villagers can participate in the management of aquatic animal resources under mechanisms and methods constructed by the villagers. Hadpana community is a stepping-stone attempting to demonstrate another perspective of the participatory aquatic animal resource management of newly settled fishing communities in Thailand. The purpose of this research is to represent this case study as an exploratory research of freshwater aquatic animal resource management of a newly settled fishing community in a reservoir without a deeply-rooted traditional knowledge system transmitted over time. This research will study, understand, analyze, and anticipate the situations faced by a community who has both the spatial and communal potential to develop themselves into a model for other communities sharing similar characteristics. Research on Hadpana fishing community is necessary both theoretically and practically to further the progression of aquatic animal resource management in Thailand for the future.

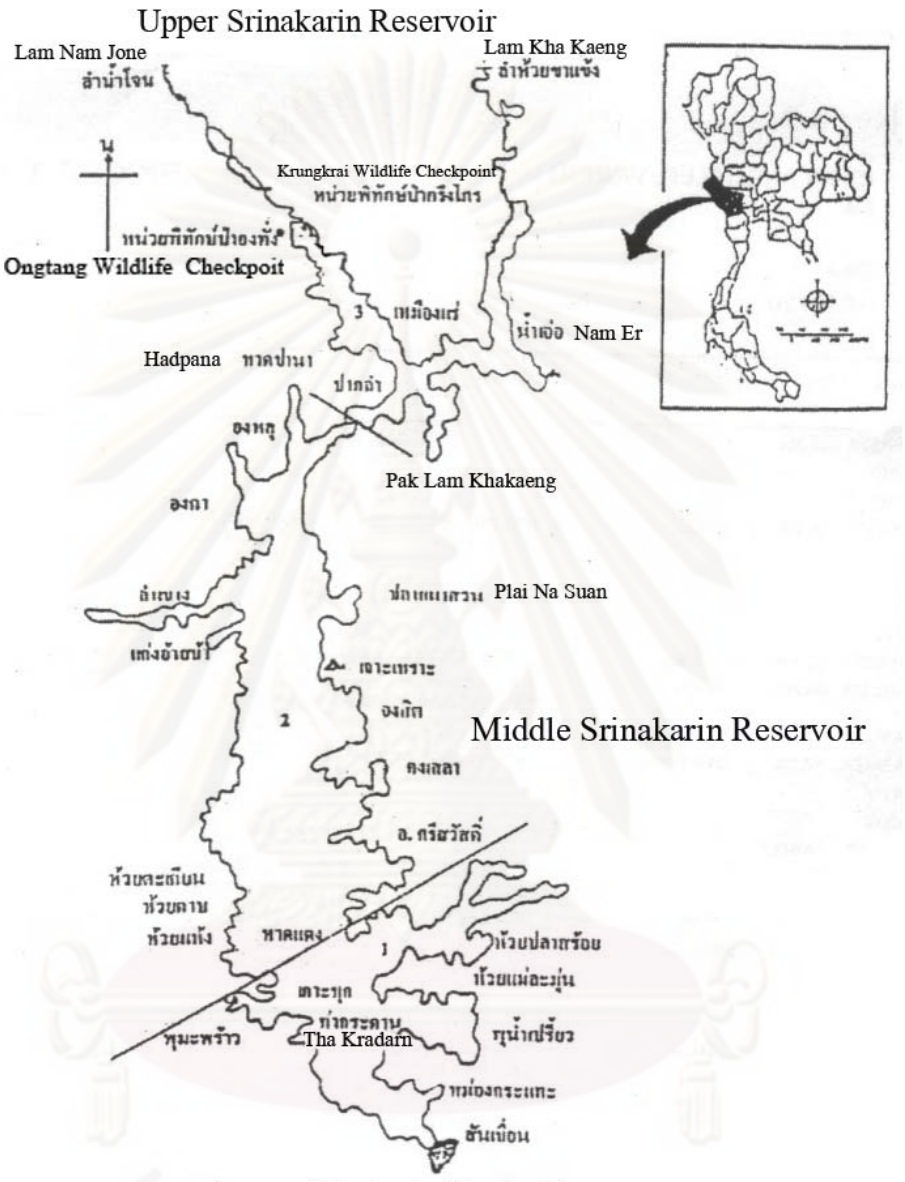

Figure 1.2: Srinakarin Reservoir

Source: Adapted from Supatra and Boonsong 1997: 5

1.2 Research Objectives

1. To study mechanisms and methods which facilitate participatory management of a community's aquatic animal resources.
2. To analyze problems and obstacles in the process of developing participatory resource management in a recently settled community.
3. To propose recommendations for future sustainable resource management of a community.

1.3 Hypothesis

Unlike other fishing communities that have been established for long periods of time in river basins such as the Mae Kong, Songkram, Ing, and Yom rivers; Hadpana community, as a newly settled fishing community, does not have an aquatic resource management system based on common traditional knowledge, customs, beliefs, and rituals. Nevertheless, Hadpana community has developed important methods and mechanisms for effective participatory aquatic animal resource management. This was accomplished through strong leadership, creation of communal regulations accepted by all members, strict enforcement of rules and regulations, as well as the development of a community organization to negotiate with external powers and the support from the Department of Fisheries. However, the community has encountered problems and obstacles in developing these methods and mechanisms. This study will identify and analyze these problems and obstacles in order to propose recommendations for the Hadpana community to maintain its ability to participate in aquatic animal resource management of the area despite the absence of a deeply-rooted traditional knowledge system transmitted over time.

1.4 Scope of Study

1. Spatial Scope

This research is a case study of the chosen site: Hadpana fishing community, Tambon Khaojot, Amphoe Si Sawat, Changwat Kanchanaburi which was chosen by the

Department of Fisheries to be a model fishing community in order to manage aquatic animal resources by villagers and conserve the resources in the area called Hadpana.

2. Demographic Scope

The study group was chosen from villagers in the community and government staff who participated in semi-structured interviews. In this research, the researcher determined the study groups who are:

1. Villagers: this study group is various in age, social status (especially, the middleman or "*Tau Kay*" who holds a very high influence in the area as the community's leader, and people who are respected as fishing experts) and ethnicity (Mon, Thai Yai, and Thai).

2. State Representatives: which are Department of Fisheries' officers working under services of the freshwater fishery patrol of the western area of Kanchanaburi, who have a direct responsibility to the establishment of a model fishing community project around Hadpana's area, and also park rangers of Srinakarin Dam National Park, who have authority over the community's use of resources in the conserved forest area. Local leaders such as village headman and Subdistrict Administration Organization (SAO) were interviewed as well since they have influence over population and policy management of the community.

3. Time Scope

This research studied the development of Hadpana community from the beginning of the Srinakarin Reservoir's fisheries and the settlement of the present community to the development as a model fishing community in 2007.

4. Length of Field Research

Since climate has such a strong influence on inland fishery in Hadpana's area, and the aquatic animal resources differ greatly dependent upon many factors such as: weather, tide, amount of rainfall, etc., the field work was carried out in all different seasons, (summer, rainy season, and cool season) to successfully study management of the resources. The length of stay in the field during each season was approximately 15-20-days/ time; moreover, there were also short periods of stay of 3-5 days/time to

collect additional data. The total length of the field research amounted to approximately 85 days. The field research was carried out during July, August, October and November of 2008 and February, March, May, and August of 2009.

1.5 Methodology

1. Research Methodology

1.1 Literature Review**:** Data from all kinds of documents i.e. theses, journals, articles, researches, and texts including Internet resources which are related to the topic.

1.2 Field Research: The field data was collected through participant observation of villagers' activities, pure observation in situations that the researcher intends not to participate in, and semi-structured interviews conducted with key informants.

The researcher conducted interviews by using a semi-structured interview guide including two types of broad questions: 1) informal interview and 2) in-depth interviews aimed at gathering profound information on important topics. Together with semi-structured interviews, the researcher also utilized informal interviews by participating in conversations with and asking questions of villagers' during their daily activities.

The semi-structured interview guide is categorized in to two forms (see appendix IV and V): the first one is for key informants that are local villagers of the community (the leader, the middleman, the committee, and the experts). This set of questions focuses on general issues of fisheries, ecosystems, fishing gear, socio, economic and cultural contexts of the community, and, lastly, the management of aquatic animal resources emphasizing mechanisms, methods, and also obstacles. Again, these questions included the interviewee's opinions and propositions as well. The second set of questions was conducted with stakeholders who are both officers from the freshwater fisheries patrol of the western area of Kanchanaburi, Local administrative organization of Tambon Khao Jot, village leaders, and park rangers of Srinakarin Dam National Park investigating both their duties and responsibilities to the community and policies towards the community.

1.3 Data Analysis: All data collected by the researcher was verified in order to identify any areas lacking crucial information by the researcher. If such an area was found, the researcher collected additional data by conducting further interviews with the same informants in order to complete the data. In the case that the data was contradictory, the researcher inquired further with experts in order to gather the most accurate data possible. During the final process, all the data gathered was examined by local experts again to verify its validity prior to the final analysis by the researcher.

2. Key Informant

The key informants were chosen from those people who hold important positions related to the community's activities i.e. Department of Fisheries officers of the freshwater fisheries patrol of the west, park rangers of Srinakarin Dam National Park, Local administrative organization officers, experienced fishermen, community leaders, community experts, members of the community's committees, and also normal villagers with various backgrounds for the purpose of gaining as much data as possible.

1.6 Expected Benefit

There are currently very few research works pertaining to freshwater fisheries management in Thailand, especially on newly settled communities which do not have a unified discourse of local knowledge or customs. Therefore, this research represents an exploratory work as a means of studying this type of community in order to understand its methods towards resource management and how they differ from communities in the former studies. This research will be useful for those who wish to gain a greater understanding regarding newly-settled fishing communities and the situations and effects of "the establishment of a model fishing community project." The researcher also expects this research to assist in the development of participatory aquatic animal resource management of newly-settled communities which are widely spread throughout the country as a means of rehabilitating many wetland ecosystems to be abundant again as they were in the past.

CHAPTER II

LITERATURE REVIEW

The essence of this research is to study the mechanisms and methods that facilitate the aquatic animal resource management of a newly settled freshwater fishing community. Since there are very few studies on newly settled freshwater fishing communities, this research will analyze theories from literary works and researches in order to fulfill its research objectives. The theoretical framework of this research is based on the concept of "Community-Based Fishery Management," which is the method of fisheries management created to solve problems regarding the decreasing numbers of aquatic resources in all areas. The concept of community-based fisheries management also consists of many other intrinsic theories related to the topic, which will be represented later in this chapter.

2.1 Theoretical Review

2.1.1 Community-Based Fishery Management

Typical modes of aquatic animal resource management, based on top-down policies[4], aimed at successful management of fishery resources have occasionally failed to reach the objectives of fishery management in many areas of the world. Within the last 10 years, community-based fishery management has been agreed upon by scholars of fisheries management from many countries to be a critical component

[4] The modes of management that are widely used in many countries are 1. Area closure 2.Seasonal closure 3. Mesh size limitations 4. Catch quota 5. Fishing gear restrictions and 6. Limited entry. These methods have been used for a long time, but the fishery resources of the world are still in a state of crisis due to the following four reasons: 1. No co-operation from the fishermen 2. High enforcement costs 3. No acceptance from fishermen due to the fact that the state established the criteria on its own without requesting any participation from those fishermen who are forced to follow the criterion 4. The state management on fisheries is not united; there are many units participating, but they do not co-operate with each other, therefore the management system lacks efficiency (Kangwan 1998: 13-15).

for fishery management focused on addressing the present situation of the decreasing numbers of aquatic animals.

The main principle of community-based fishery management is that the state (state units which are responsible in fisheries management) will transfer their managerial power over to the communities. The status of the state will be reduced to that of only advisor for the communities; furthermore, the communities will possess access rights to use the resources within the area. Moreover, together with these rights, the communities will be given the responsibility of taking care of the environment and resources in the communities' area, as well as management of the fishing area under the goals of maintaining a high quality of life for the community members and sustainable fishery within the area.

Causes of aquatic animal resource crisis under the principles of community-based fishery management are that the fishery resources have no real owner and there is continued practice of liberal fishery. The community-based fishery management's objective is to eliminate these two causes as a means of reviving the aquatic animal resources. The problem that fishery resources have no real owner is based on the concept of property described in "The Tragedy of commons" by Garrett Hardin (1968), an important hypothesis on the study on resource management through a utilitarian approach.[5] The world resources can be categorized into four characteristics of property, which are (Kangwan 1998: 13-17):

1. Public property- This type of property belongs to everyone in a society. It can be used liberally by anyone; therefore, this kind of resource is similar to the resources with no real owner.
2. State Property- This type of property belongs to the state and cannot be used without state permission.
3. Communal Property- This type of property belongs to every member living in a community; it can be used by following rules and regulations established by a community. Normally, this kind of resource will be given to a community by the state. The community has the right to use the

[5] See Anan 2000: 3-24 for the approach on the studies towards resource management.

4. property without state permission, but it has to take care of the resources as its own responsibility. The rights to resources cannot be transferred, and if the community does not want to have responsibility over the resource anymore it must be returned to the state.
5. Private Property- This type of property belongs to a person or a juristic entity approved by the law.

Those resources that fall under the category of public property are most easily destroyed; the second most threatened form of property are those resources categorized as state property, as the state does not have enough units to take care of these resources. The resources most successfully protected are the resources that are owned by the community, privately, or by juristic entities; these kinds of resources can be clearly defined as to who their owner is. Fishery resources hold the characteristics of a public property but differ from other resources because it cannot be clearly determined where an aquatic animal resource's habitat lies. Aquatic animals migrate seasonally, while other resources exist in exact areas (Santita 2000: 280). As discussed previously in the first chapter, it is now widely agreed upon that resource management should not be done solely by the state but by the cooperation between the state and resource users jointly. The United Nations (UN) put this concept into both Agenda 21 convention and the treaty on biodiversity indicating that the resource maintenance for humankind should rely on users of resources as owners who are responsible for taking care of and managing resources in a sustainable way.

Therefore, as fishery resources change status from public property to communal property, fishing communities that can participate fully in aquatic animal resource management will possess a higher determination and desire for co-operation in management. The community will be confident that profit lies within this cooperation (Kangwan 1998: 17-18).

The problem of liberal fishing is based on the characteristic of aquatic animal resources as a public property, for example:

1. The aquatic animal resources remain at open access; thus, fishery is free for anyone. It is not feasible that someone could regulate or attempt to control the use of the resources as it is very difficult to control access, and the enforcement costs are very high.

2. The increase of fishermen or catch per unit will cause catch per unit of fishing efforts of other fishermen to decrease due to the limitation of aquatic animal resources. Because of these characteristics of aquatic animal resources, over-fishing emerged throughout the world due to liberal fishing increasing only the number of fishermen without concerning the stock size of the aquatic animals. In order to solve the over-fishing problem, the mode of fishery management must be changed to one of community-based fishery management. In response to other counties, such as Japan, which succeeded in this mode of fishery management, many countries including Thailand have tried to establish community-based fishery management, but they lack two important conditions--ownership of fishery resources, and fishery control under the Fishing Rights System (Kangwan 1998: 9-10).

Therefore, the community-based fishery management needs to establish the ownership of fishery resources and fishery control under the fishing rights system in order to solve the problem of the status of fishery resources and liberal fishing; the liberal fishing would therefore be controlled by the Fishing Rights System. In practice, the state would need to determine the community's scope of ownership and people who hold rights to use and manage the fishery resources; the fishery would thus be controlled under these conditions (Kangwan 1998: 18).

The Development of a Community-Based Fishery Management System

The change of the fishery management system from a liberal to a community-based system involves economic, social, and political factors. Moreover, the most important factor is the readiness and ability of the state to transfer the power aimed at supporting the rights and responsibilities of the fishing communities over to the members of the community, as the readiness of both state units and fishing communities takes time to develop. Thus, to change fishery management systems suddenly could have negative effects due to the un-readiness of both the state and the communities. Therefore, the change must proceed step by step; the state must reduce its role gradually while the communities increasingly learn to manage the fisheries and participate in the practices of resource management. This step is called "Fisheries

co-management" and functions as a bridge connecting the state fisheries management and community-based fishery management.

Two important factors of this change are (Kangwan 1998: 19-25):

1. The state must have a distinct polity towards the change of fishery management. Moreover, state officers have to change their attitudes and roles from one of plenipotentiaries to one of facilitators and servicemen; in other words, the main character in fishery management must be the fishermen and members of the fishing communities who are directly affected by the aquatic animal resources.
2. Fishermen must be fully responsible in fishery management. The communities themselves must spend expenditures in the managing process of the communities. Firstly, the state may assist in funding for the communities, but in the long term the communities must be responsible for all expenditures according to the concept that the one who gains profit must be the one responsible for the expenditures.

The process of developing a fishery management system from one which is state owned to one which is community-based has 10 steps (Kangwan 1998: 19-25):

1. Notification- the state must announce its intention to transfer power to manage the resources over to the fishermen and explain to both fishermen and state officers their own roles and each other's roles. This step is very important because a good understanding between fishermen and officers is necessary in succeeding the objectives of community based fishery management.
2. Discussion - after the state has announced their intentions to the fishermen and explained the goals and purpose of community-based fishery management, they must further discuss with the fishermen other related topics to determine if the fishermen are interested in and are in need of the aforementioned system or not.
3. Creating co-operation- creating co-operation between state officers, fishermen, and between fishing communities in nearby areas is crucial. The co-operation and discussion amongst these groups is absolutely necessary for community-based fishery management to achieve its objectives.

4. Communication- the state needs to create two-way communication with the fishermen. In the past, one-way communication was frequently used by the state when communicating with local villagers, and it usually lead to the failure of any projects utilizing it. Two-way communication is necessary to create a communal understanding between the two groups of people involved in the project.
5. Data Exchange- precise and up-to-date data is necessary for the operation of fisheries management. The state and fishing community must exchange their data with each other. The state will provide data addressing policies, plans, funds, and academic data that is necessary data for fishery management of fishing communities. Meanwhile, the fishing community will provide information regarding the number of fish caught, fishermen, and fishing equipment to the state in order to calculate the fishing stock and determine an appropriate catch per unit of fishing efforts. This data will then be returned to the community to assist in managing aquatic resource management in the community.
6. Consultation- an important role of the state to fishing communities. The state officers must be ready to act as academic facilitators for the fishermen.
7. Co-operation- the co-operation between the fishermen and state officers will lay the grounds for a good relationship between them that will be useful in the long term as well. Again, the co-operation between fishermen is also important, as they have to participate in aquatic animal resource management in the area as a joint entity.
8. Partnership system- under the community-based fishery management, fishermen are the owners of the resources both legally and practically. Hence, all fishermen have a role and partnership in the management of the fishery resources. To establish an understanding of the partnership system it is necessary that the fishermen understand that they can take part in either the success, or the failure of community-based fishery management.
9. Control by community- at the point that the community can manage the fishery by itself, the state will allow the community to establish rules and regulations accepted by all the members of the community to control the

fisheries in the area; these rules and regulations will be obeyed and strictly acted upon by the fishermen. Therefore, the fishery control is completely managed by the community itself.

10. Coordination between fishing communities- theoretically, when all communities have community-based fishery management, they will manage their own distinct fishing territory which is connected to others' territories. To create integrated efficiency in fishery management, coordination between fishing communities will have great benefits e.g. assembling into organizations at the provincial level.

Conditions for the Success of Community-Based Fishery Management

Due to the differences in economic, social, cultural, political, and geographical contexts of the areas, there seems to be no one set of exact conditions for the success of the community-based fishery management. The studies' regarding community-based fishing communities are therefore a subjective result for each area. However, the analysis of these studies reveals 11 distinct conditions (Kangwan 1998: 25-27):

1. The exact determination of a fishery's territory for each community: the territory should be determined by geographical context related to spatial potentiality of the area for the fisheries.
2. The exact properties of community's members: to determine the criteria of member's properties it is very important to limit the number of fishermen in correlation with the limitation of aquatic animal resources and address problems of communication and management within the community.
3. The unity of fishermen: fishermen who co-operated shared similar experiences in problem solving; therefore, the groups of fishermen who were united had a very strong sense of rapport and desire to co-operate in the community-based fishery management. Community-based fishery management cannot exist without the unity of the fishermen.
4. The shared experiences in resource management of the community**:** if the community has the same experiences regarding managing the resources that

can be used publicly**,** it can easily accept the community-based fishery management that shares this same idea.

5. The profit from community-based fishery management must be more than the compensation, and the profit must be clearly represented to the fishermen.
6. All fishermen who use the resources must participate in fishery management by becoming members of the fishing community, participating in activities, and obeying all regulations of the community.
7. The criteria of fishery management must be able to proceed in practice.
8. The supporting laws: the state has to establish laws to approve fishing community's statuses, rights, power, and responsibilities in fishery management.
9. Good co-operation of the community's members is crucial, and strong leaders must act as the main characters involved in the fishery management.
10. The state must intend to share the power allotted to the fishery management with the communities.
11. There must be continual cooperation amongst the state and the fishing communities.

As mentioned above, these pre-conditions are a general idea in concept and do not function as an absolute standard. In practice, more studies are needed regarding many necessary contexts of each area, as the characteristics of each area vary. The conditions for the success of community-based fishing communities are therefore relative to the characteristics of each area.

The Positive Effects of Successful Community-Based Fishery Management.

The community-based fishery management's purpose is to solve the problem of the aquatic animal resource's status, which has long been of concern. This method is based on the involvement of the community itself as the main member, with the support of the state; however, this method needs trust and compromise from both fishermen and state officers; therefore, it needs time to develop and cannot be successful over a short period of time. Recently, many countries throughout the world have accepted community based fishery management to be the most appropriate

method for managing aquatic animal resources and promoting sustainable fisheries. The positive effects of successful community-based fisheries management are (Kangwan 1998: 28-29):

1. Community-based fishery management builds a strong relationship between groups of fishermen and has a positive effect on the higher levels of fishery management and aquatic animal resource conservation.
2. Community-based fishery management constructs consciousness amongst the fishermen of their communal and social responsibilities and can be represented in practice through many acts and activities.
3. Community-based fishery management creates fewer conflicts amongst fishermen due to the fact that it allows for the availability of a satisfying level of aquatic animal resources for every fisherman.
4. Community-based fishery management delegates fishermen greater power to be drawn upon in negotiation with external authorities.
5. Community-based fishery management allows for the unity of fishermen as a systematized organization that creates a strong entity capable of negotiating with the middlemen.
6. Community-based fishery management results in fishermen and state officers working well together; this relationship can be affirmed through the data exchange between the two groups and will be very useful for the development of fishery management in the future.
7. Community-based fishery management builds consent and concord amongst both fishermen and state officers allowing for efficient methods of fishery management to be utilized.
8. Community-based fishery management builds trust between fishermen-fishermen and fishermen-state officers. This will assist in minimizing the existence of fisheries that take advantage of others.
9. Due to the strong trust created between fishermen and state officers in community-based fishery management, enforcement will be no longer necessary; state officers will respect the fishermen's positive attitudes towards social responsibility and will therefore assist fishermen as much as the law allows.

10. In community-based fishery management, if the state considers that fishing communities can manage fisheries in the area successfully, the state will give more power and management to the fishing communities and expand the scope of the management to be wider as well.

2.1.2 Community Rights

The most important factor in the concept of community-based fishery management is that of community rights, which has been widely discussed and has become the prominent focus of many resource management studies. Within the concept of the community-based fishery management, the central concept is that of rights over resources. This concept includes access rights, usufruct rights, rights to approve, and conflict control over the rights of a community (Banchong 2002: 144), all of which are intrinsically involved with community rights.

Krisda Boonchai (1999) stated that the adaptation of economical, political, and social structures of Thailand over the past 100 years has had many negative effects on both the environment and local communities. The centralization of economics, politics, and society caused substantial growth within the cities and industries based on the rural area's resources while it simultaneously destroyed the rural areas providing the resources and the self-dependent mode of living within the rural areas. Therefore, the rural areas, in the context of the relation of power, were marginalized or stigmatized into "otherness" through defining, categorizing, and excluding them from the delegating power in order to legitimatize all development projects that subsequently brought both environmental and social problems to the rural areas.

The movements against the mainstream developments, which stem from both the state and capital groups seizing resources from local communities, rose up and protested all projects considered to be leading to the destruction of the local way of living. The ideology raised to re-adjust the relations of power between the state, capital, and people was deemed "Community Rights." At a discursive level, community rights affirms and nurtures many important grounds of thought e.g. construction of the community rights to weigh in with state and private rights in order to create alternative methods for managing resources, modes of struggling for power

distribution, peoples participation, civil disobedience to development projects causing problems, and the re-definition of "development"[6] (Krisda 1999).

Yos Santasombat (2003) mentioned that community rights attempted to propose new perspectives towards problems and conflicts in Thai society; however, in the case of community, we cannot use a static frame of thought that considers the community to be a static social relation of the past. We must rather develop the concept of community in concordance with the complex flow of social life in order to raise the concept of community rights to be a socio-cultural stage and open the social space for people who are trying to create many types of identities through symbolic systems, rites, beliefs, and their sense of community as a part of the negotiating process with external powers.

To understand community rights, we have to first understand the perspectives of "the mode of community." Modern anthropological research states that the establishment of a mode of community and identity cannot deny the relations of power established through the relationships of different creations including inclusion, exclusion, and otherness creation. Thus, the mode of community has to be considered in the contexts of space, culture, and power emphasizing the importance of the understanding of the mode of community as dynamic. The complexity of the contests for human dignity and the exchange of open space, which is not limited only to the scope of territory and resources, must be considered. This perspective further pushes us to think about community in a different way, from the nostalgic and longing perspective to a new mode that is more concordant to social reality (Yos 2004: 100-101).

The old perspective of the mode of community is represented through the basis of a structural relationship or social organization that is static;[7] however, in the modern world, the context of community is no longer limited to that of only a

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6 Yos (2004: 24-27) regarding the grounds of thought related to community rights that Yos Santasombat categorized into 5 conclusions.

7 Yos Santasombat (2004: 105-107) stated that the old frame of the mode of community is based on 5 grounds of social relations that are 1. Power ideology related to local beliefs or social transmission through dimension of beliefs 2. Rites that are the re-production of social actions transmitting communal ideology or conscience 3. Local intellectuals who serve as an important basis of the community in

structural relationship. Yos Santasombat (2004) proposed that we must consider the mode of community to be a dynamic one, and view the process of adaptation and fight through various thoughts and theories. Yos stated that this flowing mode of community is based on at least five important factors and thoughts:

1. The consideration of the mode community in the context of power relations. The mode of community, self-representation, and identity of a group occurs when encountering other groups and trying to adapt and contest with external authority. Identity establishment can therefore be considered an attempt to legitimize community rights on the grounds of humanity (Anan in Yos2004: 106), or the mode of community establishment within the cultural dimension (Sorensen in Yos 2004: 106).
2. The consideration of the mode of community in the historical context or temporal flow (Fabien in Yos 2003: 106). The mode of community establishment strongly depends on the historical conscience's construction through interpretation and the ability to recall and connect between the past and the present in order to create an expectation for the future (Tapp in Yos 2004: 106).
3. The mode of community is not static, but flows and is constructed by conditions and situations or interests that are always changing (Ong in Yos 2004: 106).
4. The mode of community is a contested cultural terrain whose boundaries and sense of scope is continuously changing (Gupta and Ferguson in Yos 2004: 106-107).
5. The mode of community occurs from conflict and resistance. In this characteristic, the mode of community is both the ideology and the ability of local people to adapt and contest with external authority (Yos 2004: 107).

Hence, the mode of community is dynamic and is strongly adhered to social space and identity's creation. In Thailand, and many countries in Asia, local communities do have collective regulations, customs, and practices related to social

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maintaining local dignity and characteristics 4. Resource management based on customs 5. Social organization

and resource management. The method that these local communities use to manage resources is very similar to the concept of community rights. Community rights; therefore, is the basis, ideology, mode of behaving, and customary law local communities uphold as the center of living. As mentioned above, when the state attempts to seize local resources, which is a violation of the community's rights, people fall back on the social and cultural grounds of the mode of community to uphold the concept of community rights. Community rights are utilized to negotiate with the state and private organizations that infringe on private and state rights by attempting to re-manage social relations, power relations, and resource management to be more equitable and sustainable.

In conclusion, the mode of community is an ideology of power or rights to participate in resource management under the state-community relationship, which is re-produced in both a cultural context and social change (Piyaporn 2007: 45).

Community rights are defined as "social regulations developed as a mode of organization of people towards resource management, economic management, and political management. Those people are grouped together as a community based on not only a common commune or village, but as a social network of people sharing the same culture, living in the same ecosystem, using the same resources, and sharing the same modes of production" (Krisda 1999). Community rights are both relations of power, legitimacy, and basis of identity represented in various complex and dynamic ways (Santasombat 2003 in Piyaporn 2007: 45-46). Moreover, community rights entails the movement of people to adjust relations of power and propose a system or organization to re-manage resources, economics and society in order to create more alternatives for Thai society. The main principles of these community rights are (Krisda 1999):

1. The community establishes rules or regulations in order to co-manage resources, economics and society. The rules or regulations might be both in written form or customary law rooted within a collective conscience. The mode of regulation's establishment is also the process of learning, contesting, and negotiation within a community and between a community and the external; therefore, the collective regulations of the community can make changes by economical, political, and social contexts. Through these

characteristics, community rights are more flexible and wider than those of a single standard, such as state or private rights.

2. The community rights have the property of complex rights. For example, there are many kinds of rights under collective regulations of the community such as usufruct rights, access rights, and managing rights. The important principle of community rights is that within the communal space that established the rights, all kinds of rights must relate to and fall under the category of community. There will be no absolute rights; there will be only the complexity of many kinds of rights (Banchong 2002: 146).
3. The community rights emphasize the participation of external powers. For example, the community rights share inclusive rights with the external powers to participate in and support the community at all levels from local and public to state. However, the inclusiveness of the community rights is not absolute either; if it were so the community's resources would become an open resource for anyone to use. The community thus creates rules and conditions to control the use from external sources, establishing that the community rights also imply exclusive access to the community's property. The community rights give priority to the resource users who live their lives as members of the community first and foremost. There is no right allowing external sources superiority over the rights of the community to survive; however, the exclusive rights are usually used solely in the case of conflict. Normally, the community rights emphasis is more inclusive of the objective of the community to not only keep the community's interests at hand, but to consider social interests for all of society as well.
4. The basis of community rights is based on sustainability and equity. All resource management methods participated in by the community require that the community's members participate, access, and share fairly. The community rights focus on the sustainability of resources in order to help the community survive.
5. Community rights are based on grass-roots movements occurring under the context that the power structure within a society is unjust; moreover, it further centralizes power and dominates culture by using monoculture to absorb

diversities and exclude local communities as marginal. The community rights therefore become the instigation for adjustment of the power relations in order to create social space within communities. By determining identities in order to push a society to be more pluralistic and to establish policies under which each local community can have its freedom to determine rules of living, economics, and resource management through a geo-cultural ecosystem, the basis of a collective responsibility within society is exercised as well.

2.1.3 Foucoult's Power and Discourse

Michelle Foucault, a French philosopher, proposed the concept of discourse through many of his works; the concept of discourse later became one of the most prominent theories of the social sciences and human sciences. Discourse, in Foucault's context, is not defined as language, words, communication, or explanations of both a linguistic or general context, but rather he defined discourse as a system that makes writing and speaking within a society possible; discourse is the determination of regulations, conditions, and mechanisms that make writing and speaking possible (Chairat 2000: 21). In other words, discourse is the network of regulations and conditions in the form of collective values, beliefs, and criterion of a society that allows for communication.

As a clear illustration, Foucault suggested that the history of madness was due to discontinuous meaning and further varied by the discourse supporting this definition. Foucault represented the case of the 17th, 18th and 19th centuries to show that the meaning of madness changed under the grounds of thinking that was a powerful criterion of each era. In the 17th century, madness was seen as a gift and holistic character given by god due to the fact that the Christian empire was extremely powerful in that era; however, in the 18th century, a century landmarked by the intellectual revolution where people trusted in the rationality of humanity rather than the faith of Christianity, the meaning of madness changed to be one of unreason and abnormal character. In the 19th century, when knowledge of psychiatry and medicine developed, madness was interpreted as an illness caused by brain disorders and the nervous system. The meaning of madness changed because the discourse, the

regulations or conditions used to create the meaning, changed. The discourse is the system and process of regulations and conditions constructing and defining identity and giving significance to everything in a society at a certain period. The regulations and conditions are in the form of collective values, beliefs, and criterion constructed by powerful social institutions at a certain time.[8]

The methods of studying and analyzing discourse consist of two methods, Archaeology and Genealogy. The Archaeology of Foucault is used to analyze any regulation, condition, or composition constructed to be a certain discourse at a certain time. However, Archeology cannot explain the reason for changing from one discourse to another; hence, Foucault developed his method of Genealogy by emphasizing the relationship between power and discourse. Thongchai Vinijakul (2534) stated that Archaeology is meant to expose the truth of things in a society that produces discourse, while Genealogy is aimed at indicating that the truth (discourse), which is constructed and maintained to be the truth, is created because there is some presence of power produced together within that discourse as well (Thongchai 1991: 40 in Jakapan 2006: 28).

Foucault explained the concept of power in Power/Knowledge (1980) through three important points (Jakapan 2006:29):

1. Power does not have only a negative side, one that suppresses, enforces, or controls others, but there is also positive power, one that constructs knowledge and the truths of things in a society.
2. Power is not centralized or drawn from any one single center of power, but power is rather the 'Micro Physics of Power;' power is spread out in every linked social space. Power is present at both the level of specific relationships, and also the relationship at the level of marginal people, i.e. poor people, madman, criminals, and others lacking opportunity.
3. Power has wise mechanisms and techniques aimed at hiding and equivocating its violence by transforming itself to be a discipline. This is an important tool of power in modern society used to control humans and force them to follow its criterion.

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[8] See more details in Foucault, M. Madness and Civilization. London: Tavistock, 1961.

The relationship between power and discourse is obviously represented through these three points regarding the concept of power. Whenever discourse constructs something in a society, it also constructs power at the same time. The positive power mentioned above is the power that Foucault considered to be responsible for constructing knowledge and the truth of things in a society. Such power also maintains things constructed under the discourse by preserving its status as truth. Therefore, power constructs the truth of things and maintains the status of truth until that power is collapsed or a new power replaces and seizes its space.

The seizing of power and change from one to another discourse exposes the 'Discursive Practice' through the relations of power reacting between discourses in various ways such as combining, seizing, replacing, controlling and obstructing. Foucault mentioned in The Order of Thing (1981) that the discourse has three important discursive practices, which are (Supachai 2001:16):

1. Any discourse having power must have a discursive practice to obstruct the other discourses by separating and negating; for example, the case and definition separating madmen from normal people.
2. The discourse has discursive practices that blockade areas and control other discourses. The discourses having more power will have the mechanism of commentary and power of correction over other discourses.
3. The discourse can bind its meaning to exist in the society legitimately through a process such as the scientific process or religious rite in order to cause the discourse to be considered credible and be accepted by the society.

This discursive practice works because of the control by power supporting that discourse. The positive power constructs and maintains the meaning or the truth of the discourse through this discursive practice.

Among the discourses existing in an era, there will be a major or absolute discourse that is more credible and accepted by the society called the 'Dominant Discourse.' For example, during the 1950s to 1980s the mainstream development (which was considered to be Modernization or Westernization) was constructed from a set of development discourses supported by state mechanisms and scientific knowledge focusing on economic benefits. This development discourse overwhelmed

and obstructed other development discourses. The other development discourses that attempted to challenge the dominant discourse were called the 'Counter Discourses' or the 'Alternative Discourses.' Foucault emphasized that Genealogy is a method aimed at opening the door for minor discourses to participate in a society (Foucault 1980:85 in Jakapan 2006:31). The truth of a discourse depends on the power supporting that discourse; however, the source of power is neither single nor limited, and the power can originate from many sources. Thus, the minor or marginal powers can support the truth of a discourse, like the dominant discourse, by supporting the discourse meaning.

Power keeps humans under the criteria of a discipline[9]; however, apart from it, knowledge[10] is also a prominent player in maintaining the ability to control. Power and knowledge support each other and exist together. There is no relation of power without knowledge construction and there is no knowledge without power. The case of local intellectuals is a prime example of a minor power available for local villagers to seize within the social space as a means of representing their intellect and ability as an alternative dialogue towards the resource management. At the time when scientific knowledge was seen as the only knowledge accepted to be correct and deemed as truth, this set of knowledge became the dominant discourse that obstructed and suppressed other discourses of knowledge. Scientific knowledge thus constructed the power to dominate social space and to obstruct the other knowledge systems. The truth of scientific knowledge became the production of power that dominated society. The exposition of minor or marginal knowledge systems, such as that of local intellectuals, is at present time widely accepted as an alternative means that can be used to solve resource management problems caused by the dominant discourse attempting to seize the space and define itself as the sole set of knowledge being supported by truth.

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9 See more details in Foucault, M. Discipline and Punish. New York: Vintage Books, 1977.

10 Knowledge of Foucault can be categorized into two types: Conaissance, which is specialist knowledge, and Savior, which is conditions, regulations, or situations that make the first kind of knowledge possible. See Chairat Charoensin-o-larn. Development Discourse. Bangkok: Vipasa, 2000. for more details.

In conclusion, discourse is “the system and process of constituting identity and significance to everything in a society under conditions or regulations e.g. values, beliefs, thought, criterion, and the powerful understanding of society including social institutions” (Chairat 2000). At the same time, discourse constructed a set of power in order to keep the truth of discourse and to obstruct and suppress other discourses. For this reason, there are both dominant discourses and alternative (counter) discourses that struggle to find space and meaning; this struggle is known as ‘discursive practice’. (Jakapan 2006: 33)

In the context of research, community discourse is raised as a counter discourse seizing its space toward the resource management from the mainstream resource management discourse (Top-down management policy by the Thai state) that seizes community rights to access and manage the resources in the community’s area. The discourse regarding the mode of community is constructed to negotiate with any external power as its main intention. The community discourse constituted identity and significance to local communities that they may have the potential to participate in resource management through their own local knowledge. The meaning of community changes from being one of only resource users, to one of owners who legitimately have rights to manage the resources constructed by the community discourse. This change facilitates increasing effectiveness towards the community’s resource management due to the powerful understanding of the society who now considers the community-based resource management to be an alternative for solving the problems of resource management and therefore further supports the discourse.

2.2 Review of Relevant Researches

Researches regarding aquatic animal resource management in Thailand are mainly based on local communities residing along coastal shores of the country that utilize saltwater fisheries. For freshwater fisheries, there are many researches on resource management of local communities along rivers such as the Mae Kong, Yom, Songkram and Mun, but all of these communities that have been studied in these researches are established communities. Researches on newly settled communities,

like the reservoir's areas, are rare. Nevertheless, these researches are necessary to study as they consist of various theories and perspectives applied to different periods of time. To clarify the scope and status of this research within context, it is necessary to study and understand researches of the past.

Lertchai Sirichai in "Local Fishing Community and Resource Management Problems" (in Banchong 2002) mentioned that a local fishing community establishes, exists, and transmits itself through its fishery resources; for this reason, the community does not relate to aquatic animal resources at a merely shallow level, but identifies itself with deep feelings of respect for the resources that of which the community could not exist without. Villagers of the community therefore created two sets of knowledge in order to live with the aquatic animal resources respectfully which are: for the intellectual to understand the nature of the resources, and for the creation of regulations regarding the mode of resource management.

Lertchai emphasized that the central concept of resource management is "the rights regarding resources," which includes access rights, usufruct rights, the right to approve, and conflict control over the rights of a community. Moreover, Lertchai also mentioned that the system of rights on properties that is created, used, and controlled by the resource users will be more sustainable and effective than the system determined by external authorities. Thus, the resource management of the fishing communities is not an out-dated or ineffective system, but is well crafted and seriously used by resource users to solve resource problems. The system is adjusted to be concordant with the age of the local resource users so that they may have their own authority to take care of themselves and make their own decisions regarding living appropriately.

In the research regarding "The Role of Local Fishing Community in Seashore Resource Management and Law Enforcement around Pattani Bay Area" by Piya Kijtavorn (2000), it was found that villagers believed that aquatic animal resources are the collective property of the community belonging to the Allah. The resource management must therefore maintain rules and regulations based on the understanding of nature and the importance of using the resources fairly without taking advantage of any community members. Villagers of this fishing community created regulations stating that the sea and the resources are open for anyone; it is in

other words a no man's land that cannot be owned. Moreover, villagers cannot use any kind of destructive fishing gear since the effect would be troublesome for the majority. The use of resources depends on each person's ability. Rights in the context of the villagers are reflected by actions that the villagers make that do not cause trouble to any others through inherent rights of possession.

The fishing community in this research also faced obstacles that destroyed the community's base of resources such as commercial fishing boats using destructive fishing gear around the community's area, and the development of projects by the Thai state. In response, the community created a set of knowledge constructed by a value system, intellectuals, and local customs to manage the resources in order to maintain a self-dependent mode of living and conservation of the ecosystem. Moreover, laws geared towards local intellectuals, values of affirmation, and ecosystem conservation of the community were also established in order to confirm the status of the community that has the authority to manage aquatic animal resources in the area.

The *Thai Baan* or *Chao Baan* researches of the Yom, Salween, Mekong, and Mun rivers by village researchers of these rivers' areas provide a general idea of local fishing communities along the main rivers that have been settled and established for a long period of time (Chiangkhong-Viangkaen Tai Baan Researchers 2006, Sayan 2006, Pianporn 2005, and Chantra 2006). The researches' results represented that these aforementioned communities established their own groups of intellectuals whose knowledge pertained to the ecosystem, forms of fishing gear, and also fishing techniques in order to fully understand their resources. Moreover, these communities used the intellectuals to construct a mode of aquatic animal resource management based on primitive beliefs of the communities. The primitive beliefs of these communities are the beliefs of guardian spirits or *Phii* who own and protect the rivers and their resources. These beliefs are represented in the modes of resource management through their use as a means to control unwanted behaviors and to construct a conservative conscience amongst the villagers. Apart from the mode of resource management based on primitive beliefs, all of these communities further established regulations by collective approval of the community's members to control destructive fisheries and protect breeding grounds for sustainable fisheries. Research

regarding the Yom River states that the regulations established by local villagers living along the Yom River were further enforced by state officers as well. All the researches stated that these villagers were very strict in following both their primitive beliefs and the communities' regulations; therefore, the presence of aquatic animals in these areas flourished.

Another important issue that the *Thai Baan* research addresses is the issue of rights. The *Thai Baan* research proposed that the intellectuals of fishery act as medians between the relationship of man and nature in relation to each other i.e. humans do not determine nature completely and vice versa, but rather man and nature react to each other. The concept of rights is further proposed to be an aspect between the relationships of humans and humans as well. The ability of the intellectuals to understand necessary actions for productive mode (fisheries) through this concept is utilized (Thai Baan Researchers of Pak Mun, and SEARIN 2002: 40). Rights, in the context of these communities, refers to the right to determine persons who can participate in fisheries within the area. These researches indicated that since villagers believe that aquatic animals and rivers belong to all villagers, they further believed they could practice fisheries in the areas; it should therefore be considered that the villagers believed that they maintained full rights to participate in fisheries in the areas; however, this does not mean that the villagers could do whatever they wanted. In the researches it is stated that villagers must respect the access right of persons who firstly practiced fishery in the areas or accessed the fishing spots firstly i.e. they must not interfere with others' fishery by any means.

In conclusion, the *Thai Baan* researches proposed that the mechanisms to manage aquatic animal resources of these communities are based on traditional beliefs, but all communities still have regulations established by the collective approval of members to control the use of resources be means of both folk and legal procedures.

The study of Pornpana Kuaycharoen (in Chontira 2003) emphasized the concept of property as the main factor instigating the change of the community's mode of resource management. The study site of this research is the Nong Yai community (assumed name) in Sakonnakorn. The mode of resource management of

the Nong Yai community firstly draws upon individual rights based on property to manage, i.e. whoever establishes a means of catching fish in the *Boong* or *Taam* forest should have rights to own the space to catch that fish (*Kad*)[11] every year. The right to own the space, that is called *Luang Kad*, to *Kad Pla* can be transmitted to the next generation (that I-san people refer to as *Kad Mul*); however, the right will exist only as long as the owner of the land uses the space or *Kad Pla* every year. The process to transform the right of *Luang Kad* from a family's property to be the right of ownership by the community caused conflict for over 12 years (1987-1999), but finally the process was carried out successfully. Pornpana mentioned in the research that the change of the rights of property from Kad Mul to communal property was an institutional change, suggesting the change of the structure of rights and responsibilities from one of a relationship management based on men and resources, to one based on the relationship between men and the community. The Nong Yai community combined both national institutions, e.g. village committees and local administers with local institutions that uphold the ideology of power based on the belief of *Phii* in order to establish a re-management of these complex rights, i.e. individual rights and communal rights to be one (Pornpana in Chontira 2003: 290-291).

In this research, Pornpana concluded that because of the profits present at both an individual and communal level by the resource management, in the way of the right to public property, the co-operation between the community's members is very successful. The co-operation of villagers is therefore based on the condition that they could increase their profits. In this research, the change of the system of rights to be a system based on the rights of public property proved to be more profitable than individual rights that used no form of co-operation. Nevertheless, it is not necessary that the rights to property be changed only in this way. The system could be changed back and forth depending on the community's profit margin of the given period.

The Report of Knowledge System Development Project to Increase the Value of Natural Resource in Community of Community Organizations Development Institute (CODI) in 2008 synthesized that the wetland ecosystem management by the

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11 *Kad* is I-san dialect used in the context of fishing. The meaning is obstruction e.g. using net to obstruct the stream to catch fishes called *Kad Pla*

community is the management of people in the area to teach them how to manage natural resources in the wetland areas through a holistic perspective, i.e. humans and natural resources depend on each other to exist in equilibrium and sustainability. This methodology is based on the communities dependence on the wetland ecosystem's resources to survive and the origin of the communities desire to maintain relationships between humans, nature, and the supernatural.

The wetland area management relies on concepts of dependence and use such as:

1. The system of dependent: considering the relationships between humans and nature in various ways to form a model of resource management based on the basis of community culture and community rights approval. Briefly, the restoration of the resources together with the construction of the community's strength.
2. The system of use: considering both biological and cultural diversities by sharing authority amongst villagers to participate in regulation establishment.

CODI report mentioned that the wetland resource management by local communities requires two important aspects of composition in order to succeed in resource management (Community Organizations Development Institute 2008: 22-23). These aspects are:

1. Beliefs and rites: transmitted through time from ancestors. These beliefs and rites fall in line with the ecosystem of the wetland resources in relation to nature and the supernatural through rites and customs of both animism and Buddhism in order to construct a collective conscience and participation of the community's members.
2. The knowledge towards natural resource management can be categorized into two characteristics: 1. Knowledge of management according to traditional beliefs, local customs, and management drawn from Buddhist customs. 2. Knowledge of uses that lie within the community's established productive system according to cultural, productive, and valuable conditions, as well as the use of the wetland ecosystem and its biodiversity, and the development of a community organization.

CHAPTER III

COMMUNITY SETTING

The western part of Thailand[12] consists of eight Changwat that are Kanchanaburi, Suphan Buri, Ratchaburi, Nakhon Pathom, Phetchaburi, Samut Sakhon, Samut Songkhram and Prachuap Kiri Khan. The prominent features of this area are the diversity of resources, ethnicity, and local community ecosystems; however, this area lacks a main political and cultural identity, as it is only a part of a national administration without any political power as a kingdom (Anan 2000: 296). The most prominent physical characteristic of the west is the mountain ranges of 1500 meters in average height that stand alongside the border of Thailand and Myanmar. The areas near the greatest mountain range are home to abundant forests and many water sources that are the origins of many important rivers i.e. the Mae Klong River descending from the Thanonthongchai-Tanao Sri mountain range in Tak, as well as the Kanchanaburi, Kwai Noi, and Kwai Yai Rivers which are branches of the Mae Klong River. The west of Thailand also has ethnic diversity due to the fact that many ethnic groups such as the Mon, Lao, Karen, Khmer, etc. have settled in this area since the 19th century in response to wars and conflict (Srisak 1993 in Anan 2000).

Kanchanaburi is a province (Changwat) in the west. The Changwat itself is known as a historical site because of World War II and hostilities with Myanmar. Kanchanaburi has an area of 19,483 square kilometers, more than half of which are forest areas. Because of the abundance of forest and water resources in the area, the Thai government considered that this Changwat was a suitable location for building a dam to support irrigation projects and produce electricity. There are three important dams in Kanchanaburi known as the Vajiralongkorn Dam (Khaolaem Dam), a multipurpose dam in Amphoe Thongphapoom which was built to obstruct the Kwai Noi river; the Mae Klong Dam, a dam used mainly for agricultural irrigation in

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12 The western part of the country as considered by geographical context; however, in local administration, this area is included within the central part of the country.

Amphoe Tha Muang; and the dam that is considered to be the most important dam in the Mae Klong river basin development project, the Srinakarin Dam.

The Srinakarin Dam is a multipurpose dam that was built by Electricity Generating Authority of Thailand (EGAT) as the first dam of the Mae Klong River basin development project. Located in Amphoe Si Sawat, Changwat Kanchanaburi, Srinakarin Dam is 140 meters in height and its ridge, situated at Baan Tha Kradan, is 610 meters long and 15 meters wide. The reservoir over the dam is 419 square kilometers in area and has the capacity to store up to 17,745 million cubic meters of water, making it the highest capacity dam in all of Thailand. The dam area occupied by the dam occupies around 14 percent of the total area of Amphoe Si Sawat. Since the dam is a multipurpose dam, it is used for various purposes such as irrigation, producing electricity (it is a hydro electric dam and can produce the highest amount of electricity of any dam in the country), diminishing floods, fishery, water transportation, and tourism (Nu 2004).

Because of its forest-surrounded location and abundance of aquatic animals, agricultural, and forest resources, many people chose to settle in the area. The main occupations of Si Sawat people are farming, agriculture, fisheries, and various occupations within the tourism industry. Fisheries in the reservoir of the Srinakarin Dam[13] also profited from the dam construction. Apart from the presence of natural fish originating from the source of the Kwai and Mae Klong rivers, the Department of Fisheries releases many kinds of economic fish into the reservoir to support fisheries in the area as well; thus, local fishing communities are wide spread and plentiful around the Srinakarin Reservoir.

3.1 The Background of the Hadpana Community

The Srinakarin Dam building project began in 1973 and was finished in 1980. During the process of the dams construction, the water flooded into the area that later became the reservoir of the Srinakarin Dam. This area consists of 5 Tambol that are *Tha Kradan, Nong Med, Daan Mae Shalaeb, Nasuan* and *Khao Jode*. The population

13 The reservoir formally called Talae Saab (lake) Srinakarin or Talae Saab Chao Nen.

of people living in the area is comprised of multi-cultural groups who previously settled or recently moved into the area. There are ethnic groups who have been settled in the area for a long time such as the Karen, Kamu, and Lao. After water flooded into the area, 19 of the 22 villages within the 5 Tambol submerged under water. EGAT organized a project to compensate and re-settle these people in the new land; however, the ethnic groups, especially the Karen, did not move to the new settlement organized for them, but rather they moved to the north of the Kwai Yai River and settled their own community (Kobkul 1985: 15-21).

After the flooded area became the reservoir of the Srinakarin Dam in 1980-1981, many people began to move to the area in order to pursue business opportunities such as logging, fisheries, and tourism. In the early period, the Thai government did not pay much attention to natural conservation; therefore, the overuse and abuse of natural resources began. People were permitted to go deep into the thick forests and water sources in the area called the upper Kwai Yai-Mae Klong River in order to practice logging and fishing of a large number of products. People even settled and established homes in these types of areas without considering the negative effects on the nature.

Time passed and a lot of the nature and resources were deteriorated; the Royal Forest Department and the Department of Fisheries therefore established and enforced laws to limit the destructive use of these resources. Following the death of Sueb Nakasathien, the former head ranger of Huay Khakaeng, in 1990 Thai society became much more aware of natural conservation. The consequence of this awakening caused many areas to be named natural conservation areas. Therefore, the area in the upper Kwai Yai-Mae Klong River, which is considered to be in the area of the western forest complex, the most abundant forest area of Thailand, is under the influence of the stream of conservation as well. The areas around the upper Kwai Yai-Mae Klong River that are considered to be important habitats for rare animals and spawning grounds for many kinds of fish became restricted areas, and people who had previously lived there were forced to move elsewhere. The first expelling period began in 1995; fishers living in the north close to the water source of the Srinakarin reservoir called *Kang* 38 (Isle 38) were expelled to move south and re-settled their rafts over *Ong Thang*. The second expelling period occurred in 1997, at this time

fishers were gathered together to live in the same area and the area over *Ong Thang* was closed and reclassified as a restricted area.

The Royal Forest Department constructed a wildlife checkpoint at the very north end of the Srinakarin Reservoir in the area called *Ong Thang*. This checkpoint is used as the ranger's office and lodging for the Department of Fisheries officers who patrol the area. Therefore, *Ong Thang* is the starting point of the restricted area where any kind of fishery or forestry is prohibited. People who had previously made a living in the area and were now restricted, as well as the Karen who had moved to the north after the flooding, moved south to find new areas for settlement. From an interview with the fishers who have lived in the area of the Srinakarin Reservoir for more than 20 years, many fishers moved south after *Ong Thang* became restricted and they found places approximately 2 kilometers from Ong Thang to settle as new residents. Since these fishers live in floating rafts, it was very easy for them to drag the rafts from the previous areas to the new settlement. The fishers settled in the new location and gathered together to become a unified group of fishers. However, this group of fishers does not at this time hold the status of *Muu Baan* (village) or community in the definition of the administrative organization. This is because the rafts, which are the fisher's residencies, have no titles or deeds and only some rafts have a house number registered within the Thai census. The only document they have to identify their residencies is the document of the raft's ownership granted by the Si Sawat district office. Fishers living in the Hadpana area thus are listed under Tambon Khaojot, Amphoe Si Sawat.

In 2000, the Department of Fisheries officers began visiting the Hadpana area in order to collect data and conduct research aimed at surveying the potentiality of the space and the potential for the establishment of a fishing community. They began providing the villagers with information regarding the project, collecting data on fish species and water to research, and meeting and sharing ideas with villagers in order to develop the participatory aquatic animal resource management in the area. Through these actions they found that the fishers had the potential to participate in the management. One key factor leading to this decision was the fact that the fisherman had represented their abilities by uniting together to prohibit destructive modes of fishing within the area.

Due to its potential of space and human resources, the Hadpana area was chosen by the Department of Fisheries in 2007 to be the location for the establishment of a model fishing community in order to create a community successful in participatory aquatic animal resource management according to the project's objectives. The status of the fishers group of Hadpana, therefore, changed to be a model fishing community. The mode of community of Hadpana is established through the support from the state unit (the Department of Fisheries) in the context of the relations of power to re-systematize the aquatic animal resource management within the area. The mode of community of Hadpana is not a community in static meaning or in form of a structural relationship or social organization; it goes beyond that perspective to be one of a discourse. The community discourse of Hadpana therefore is constructed as a means of returning the power to manage the aquatic animal resources of the fishing community back to the villagers. The changed status from a group of fishers gathering together in the same area to a community established by the state unit (Department of Fisheries) is aimed at giving legitimate power to the villagers of Hadpana to manage the resources in their own area and negotiate with any outsiders or external authorities attempting to take advantage over the resources in the Hadpana area.

Figure 3.1: Upper Srinakarin Reservoir- Hadpana and Important Landmarks

Source: Adapted from Supatra and Boonsong 1997: 5

At the present time, Hadpana community is situated at Mu 1 Tambon Khaojot Amphoe Si Sawat Changwat Kanchanaburi; the community has about 28 resident units, and the population of about 74 people (42 male and 32 female). The population consists of 35 Thais, 24 ethnic people called *Thai Phu Khao 9 Phao* or *Thai Ti Rab Sung*, and those who are not registered within the census yet (Art, Interview 23 February 2009, and Waipot, Interview 27 August 2009). The community has named Mr. Waipot Nangnoi as the community's leader who is in charge of the model fishing community project.

3.2 General Features of Hadpana Community

Hadpana community is located in the north of the Srinakarin Reservoir in Tambon Khaojot, Amphoe Si Sawat, Changwat Kanchanaburi. The community covers an area 5 kilometers in length and 150-1,000 meters in width dependent upon the physical features of the area**.** Within this zone, the Department of Fisheries established a law restricting any fishers from outside the area to operate fisheries; therefore, from the sign (in pic.1 below) to the location of the Ong Thang wildlife checkpoint, which has another similar sign stating "No fishing," the area is restricted and under the responsibility of the Hadpana model fishing community; ensuring that only Hadpana's fishers operate fisheries in the area.

Figure 3.2: The sign presenting *Hadpana* as a model fishing community. This sign is considered to mark the beginning of the restricted area.

The location of Hadpana community is surrounded by forests lying within the Srinakarin Dam National Park that is a part of the western forest complex originating from Tak in the north. The forest area near Hadpana community is at this time abundant because of the very few disturbances from humans due to the strict law enforcement of the park rangers (Nit, interview 27 Feb. 2009).

Hadpana villagers live in floating rafts without electricity or a pipe water system. They use water from the reservoir in their daily lives, and they use solar cell partition or electric generators using gasoline for fuel to generate electricity. Normally, the fishers tie two or three rafts together in order to live in the same area as a family; therefore, they do not live as a big group of rafts, but they spread their settlement out inside of the Hadpana community's area wherever they like. Rafts in the Hadpana community's area thus are fishers' places of living, including only one grocery store and one fish-trading raft (*Pae Pla*) at *Tau Kay's*[14] raft where all fishers sell their fish.

Figure 3.3: Fisher's rafts

Figure 3.4: *Pae Pla* or Fish Market and grocery store on the left side of the raft

14 *Tau Kay* of the community is Mr. Waipot Nangnoi who assumes the status of the middlemen and the leader of the community.

The climate of the Hadpana fishing community is the same as the climate in Kanchanaburi, extreme weather ranging from very hot during the day to very cold at night all year round. The best season for fishery in Hadpana is during the rainy season after the reservoir has an adequate amount of rainfall and the water becomes muddy just like water flushed from the soil at the end of the cool season (from the end of October to March). In the summer, the reservoir has such a low level of water that it affects fisheries in the area. Fishers cannot catch many fish during this period, and it is not worth the cost of the gasoline to operate fisheries. In the beginning of the rainy season, the amount of fish improves but is still not ideal; the fisherman are however able to catch a minimal amount of fish. For additional income, the residents harvest a kind of vegetable called *Phak Whan*[15] (Melientha suavis), bamboo shoots and forest mushrooms to sell during these seasons while waiting for the fishing conditions to improve. Finally, when the muddy water or *Nam Dang* (red water) flows through the creeks following adequate rainfall, the most abundant fishing season begins.

3.3 The Social Structure of The Hadpana Community

3.3.1 The Attributes of the Community's Settlement

According to the background of the Hadpana community, the areas residents moved south due to the law enforcement of the Royal Thai Forest Department and the Department of Fisheries. The physical move of the fisher's homes was carried out by tying their rafts to long-tailed boats in order to pull them south. It could be said that this was simply a move of the rafts from one place to another. Villagers of Hadpana live in their rafts as a family of 2-4 persons. There are many extended families in the Hadpana community where a family's first generation owns one raft and the second generation owns another; they tie their rafts in the same location in order to live together. Some families, for example the leader's family, tie five rafts in one joint location.

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15 A kind of vegetable in the Opiliaceae family; in Thai it is called either *PakWaan* or *PakWaan Pa* to differentiate between two kinds that are similar to each other. The branch and tip of this vegetable has a sweet taste and high nutritional value.

According to the regulations of the Royal Forest Department, the fishers hold no rights to own any land inside the national parks; therefore, they are forced to live solely on their rafts. The residencies of Hadpana village consist of floating rafts built from logs of hardwood that flowed down the stream during the rainy season, as well as materials such as metal floats or bunches of bamboo. The fishers usually roof their rafts with Nipa Palm Leaf (*Bai Jak*) and Vetiver Glass (*Bai Faek*) that they can either buy or make themselves. Since they have to use many products from the forest to build their homes, the Royal Forest Department controls the use of the resources by placing limitations on raft building. Nowadays, fishers in Hadpana cannot build any additional rafts, but the Royal Forest Department does allow them to restore their rafts if necessary. Moreover, the wood used to build the rafts cannot be cut from the forest; the fishers must find the wood that flows down the stream or use dead trees permitted for use by the Royal Forest Department's officers. The only tree that villagers are permitted to cut down in order to build their rafts is bamboo, although they must ask permission from the officers to use this resource as well.

The fisher's rafts are tied with ropes to big trees or rocks on the shore in order to keep the rafts stationary. Fishers can choose the location to tie their rafts freely, but the access rights to choose the location is accepted amongst the fishers through a first come-first serve basis. Moving a raft around the Hadpana area is permitted as well, but the fishers need to inform the community's leader before moving. The space behind the rafts is allotted to the fishers by the Royal Forest Department to be used for planting vegetables in the dry season when the water level decreases; every family is able to use their designated space to plant vegetables annually. Nevertheless, the allowed space is only that of the decreased level of water, which is not big enough to forego any large amounts of planting or harvesting. Hence, vegetable planting practiced by fishers is only adequate for household consumption, not for commercial purposes. This allowed planting by fishers is the result of a compromise reached between the fishers and the park rangers towards the use of the land. As discussed earlier, fishers hold no legal rights to the land use within the national park.

Every raft in the Hadpana community must be registered with the village headman (*Phu Yai Ban*) or Si Sawat district office (*Amphoe*) in order to receive a document of raft ownership, and every restoration or supplement must be brought to

the attention of the Royal Forest Department before beginning construction. To register rafts for a house number, fishers must make a request to the Si Sawat district office. Many rafts in the Hadpana community do not have a house number. The estimated number of registered rafts is about 10, and none seem to be very interested in requesting it; however, the rafts holding a house number maintain a special right to receive solar cell partitions for generating electricity within their own rafts. The rafts that have house numbers can make a request for residence registration booklets (yellow color) as well.

The census of the Hadpana villagers is registered with the Tambon *Khaojot*. As mentioned previously, the Hadpana community has both Thais and ethnic groups, a *Khaojot* Sub-district Administrative Organization (SAO) therefore also grants ID cards for ethnic people, but they are of a different type. The ID card for ethnic people has a pink color with no surname on it and expires in 6 years; however, the cardholder has no rights to travel in Thailand as a Thai citizen since police officers do not accept this kind of identification card. Drawing from an interview with the assistant of the village headman, it was stated that those ethnic people must wait for 6 additional years in order to have the right to travel in the country as a citizen (Villagers of Tambon *Khaojot*, interview 23 Feb. 2009). Though Hadpana community has many groups of people from different cultural roots, the multiculturalism of the Hadpana community is not evident in either the resource management or daily life of villagers. Furthermore, Buddhism exists as a common belief system upheld by all villagers. The sub-cultures of each group seem to have its role in the personal spaces of each group more so than in community customs or activities. The blend between ethnic groups is also evident in the Hadpana community through marriage. The identity as fishers is thus represented more clearly than the identity of each ethnic group.

From this concept of community-based fishery management, one of the anticipated characteristics of the aquatic animal resources management in the area is that the increase of fisherman will decrease the catch per unit fishing effort of other fishers due to the fact that the aquatic animal resources are limited (Kangwan1998: 18). The Department of Fisheries has also expressed concern regarding this problem; thus, the Department has limited the number of fishers by naming the Hadpana area to be a restricted area available only for Hadpana villagers' use. Moreover, the

Department also established a regulation not allowing people from outside areas to move in. However, there are exceptions made for villagers' relatives who wish to move to the area. The relatives who want to move in to the Hadpana community must firstly be socially accepted and judged by the community's leader and other villagers to be qualified to move in to the area of Hadpana (Villagers of Tambon *Khaojot*, Interview 23 Feb. 2009, Nit, Phra and Waipot, Ma, Interview 25 Aug. 2009).

3.3.2 Daily Life of Hadpana Villagers

Most of the Hadpana villagers live their lives as fishers who earn their livings mainly from the practice of fisheries while a few rich persons are investors on animal husbandry and fish trading. The lives of Hadpana villagers are not different from the past since the community itself is excluded by the limitation of nature; the way of life thus is not influenced much by the modern way of life in the cities.

The daily life of Hadpana fishers in general begins by placing *Khai* (Seine Nets) in the water from 6.30 a.m. to noon and returning to the rafts to have lunch and rest before going out to place the nets again from 2 p.m.-6 p.m. The seine nets are checked within the next day or two dependent on the conditions of fish and water. After placing the nets, fishers light up *Yor* to lure the fish around 8 p.m. and wait until midnight, 3 a.m. or 6 a.m. to lift the *Yor* depending on the decisions of the fishers in regards to the conditions. After they gather fish from their sites, the fishers then bring them to their rafts to sort. The small ones will be used to feed the fish in cages or floating baskets while the others will be brought to the fish trading rafts to sell. In the spawning and dry season, which is not good for fishing, the fishers rarely go to fish unless they know that some kinds of fish are coming from the water source in order to budget their use of gasoline. Villagers who do not go out to fish stay at the rafts to prepare food for fishers and take care of the fish in the floating baskets. The other types of fishing gear that are used occasionally vary by the conditions of tide and season. Food sources for villagers are mainly fish and vegetables that they grow behind the rafts.

Figure 3.5: The Settlement of Hadpana Villagers

(Hand-drawn by researcher)

3.3.3 Public Utility

As mentioned above, the Hadpana community does not have its own electricity or water supply due to the area of its settlement; hence, villagers need to find their own ways to manage the use of these public utilities. For electricity, villagers having house numbers use solar cell partitions connected to a battery to generate electricity, while the others who do not have solar cell partitions use gasoline generators. Batteries and gasoline are sold at the community leader's raft.

Obtaining water is convenient for Hadpana's villagers since they live in a reservoir; however, they do not have a water supply for all activities. Water taken from the reservoir is used in various ways. For drinking water, some villagers boil the water from the reservoir before they consume it, but many ethnic groups drink directly from the reservoir as they consider the water to be natural and clean enough. The belief of the ethnic groups regarding the cleanliness of the water is partially true, since the water in some periods of the year is very clean, but Thai villagers in general do not drink the water directly. Villagers use the water in the reservoir for bathing, but only from areas they consider not to be polluted due to the fact that they have experienced no skin irritation from using the water in the area. Water used in agriculture is not a problem for villagers since they have only a very small space to plant, and can therefore water the plants directly from the reservoir by using only a water bucket.

3.3.4 Public Healthcare

Hadpana community is situated quite far from the hospital and public health center. *Satarn Phra Baramee* hospital at Tambon *Muang Thao* is the closest hospital to the community and the only hospital in the area that Hadpana villagers can use their health cards to obtain treatment and care for free. Furthermore, many villagers do not like to utilize *Satarn Phra Baramee* hospital because of the poor service. Therefore, villagers choose to go to *Thung Makok* public health center at Tambon *Muang Thao,* which is not far from *Satarn Phra Baramee* hospital, to diagnose their symptoms first. If the symptoms are crucial, the health center will contact the hospital to admit the patients. Typically, villagers go to health center to buy their medicine

without a diagnosis, and only visit the hospital if necessary as a means of saving money.

3.3.5 Education

Hadpana villagers normally send their children to study at *Baan Nasuan School***,** situated at Tambon Plai Nasuan Amphoe Si Sawat, which is about 30 kilometers from the Hadpana community. *Baan Nasuan School* is a boarding school teaching classes from a kindergarten level to a high school level. From the information based on the local database of 2006 (Academic Resource and Information Technology Center of Kanchanaburi Rajabhat University), *Baan Nasuan School* has 11 teachers and 248 Students. Students from Hadpana community study and live at the school, and returning home only on long weekends. Most of the children from Hadpana study until they finish elementary level or junior high-level at the highest. Very few students continue studying past this level and most learn about fisheries and continue living as fishers. Though Hadpana community is situated far from the school, there is no obstacle for the villagers to send their children to study due to the fact that most schools in the area organize boarding service for the children from the fishing communities.

However, villagers of Hadpana have expressed concern that the teachers of *Baan Nasuan School* do not take care of their children adequately. In 2008, there were 17-18 children running away from the school. This was not a first occurrence; it has happened many times causing many Hadpana villagers to consider it a usual situation. Therefore, many families in the Hadpana community prefer that their children stay home and help work in the fisheries rather than go to school.

Prachamongkol School in Tambon Somdej Charoen, Amphoe *Nong Prue* is another school situated near the Hadpana community. It is also a boarding school and many villagers plan to send their children to continue studying there. Since the school is under Princess Sirindhorn's project, Hadpana villagers have more confidence that *Prachamongkol School* will be a better place for their children. However, this school is situated much farther from the community than the *Nasuan School*. This could be a reason why some families not to send their children there as well.

3.3.6 Transportation

Long-tailed boats are simple vehicles used in the Hadpana community to travel around the Srinakarin Reservoir. Every family has at least one boat, and if there is more than one member of the family in fishery, that family will have at least one boat per fisherman. Long-tailed boats serve as both a job accessory for the fisherman and a vehicle for the families at the same time.

If Hadpana villagers would like to travel outside their village, they usually take their personal boats to one of the two main piers that are the *Nam Er Pier* and the *Nasuan Pier*. *Nam Er Pier* is located about 10 kilometers from Hadpana; the piers are situated in Tambon Tung Makok close to Suphanburi. Villagers tie their boats to the pier and continue traveling by truck or bus. This route is normally used for villagers who wish to travel to the upper part of the country. Another pier, *Nasuan Pier*, is located about 30 kilometers from Hadpana. Villagers who wish to travel by southern route usually tie their boats at the *Nasuan Pier* and travel by truck to Kanchanaburi city for further transiting at the Kanchanaburi bus terminal. Villagers can tie their boats at the piers safely since people living around the area of the upper Srinakarin Reservoir know one another quite well.

Transportation of goods to the community also utilizes trucks and large long-tail boats to deliver goods from the piers to the leader's rafts. Goods delivered to Hadpana are rice, dried foods, snacks, liquor, and useful articles such as lighters, spare parts for boat, clothes, fishing gears, fuel, batteries, tools, and ice to freeze fish.

3.3.7 Beliefs in Hadpana Community

Since Hadpana community is a newly-settled community, common traditional belief systems having influence on resource management do not exist like they do in established communities. The beliefs in the Hadpana community are a blend between Animism and Buddhism, which are commonly found in local communities of Thailand. Buddhism is the professed religion of all the community's members. Most of them practice Buddhism by listening to sermons, making merit, and participating in Buddhist holidays. Since Hadpana community itself does not have a temple inside the

community, villagers travel to *Wat Pak Lam Kha Kaeng*,[16] which is located six kilometers south of the community to practice their Buddhist faith. Nevertheless, villagers do not frequently go to the temple, as the distance is quite far and there is a high expense on gasoline. Therefore, only during important Buddhist days and Buddhist days of worship do many villagers typically go to pray, listen to sermons, and meditate in the temple. In addition, many monks of *Wat Pak Lam Kha Kaeng* also travel to Hadpana community to *Rab Bat* (receive food presented to the monks) from villagers on some important Buddhist days such as the end of the Buddhist lent (*Ork Pansa*). The monks realize that villagers of Hadpana stay quite far from the temple so they travel to assist in creating an opportunity for them to make merit.

Figure 3.6: The Stainless Temple of *Wat Pak Lam Khakaeng*

Villagers of Hadpana community hold their most important Buddhist ceremony in December beginning on the 5th of the month and continuing for 10-15 days. This ceremony is called *Pariwaht* (the ecclesiastical self-restraint) where monks from many provinces will come to stay overnight in the area in order to review their

16 A temple in Tambon Khaojot, Amphoe Si Sawat, located on a hill near the place called *Pak Lam Kha kaeng*, which is an area that leads to *Huay Kha kaeng* wildlife sanctuary in Uthai Thani. *Wat Pak Lam Kha kaeng* is famous for housing the only stainless temple and Buddha image in the world.

past infringements and restrain themselves to repay. During *Pariwath* ceremony, Hadpana villagers participate by cooking and taking care of guests who come from other provinces; this type of activity helps the community to support their Buddhist beliefs and encourages co-operation amongst members of the community at the same time. The co-operation amongst Hadpana villagers occurs frequently when one of the community's members requires labor assistance to fix their rafts, floating baskets, or any other tasks that require co-operative labor; villagers are always willing to help their neighbors. This characteristic of the villager's relationship has constructed a sense of unity within the community that is very useful for the aquatic animal resource management of the community.

The Animistic beliefs of Hadpana villagers are represented through the construction and use of spirit houses. Almost all families in Hadpana have their own spirit houses located on the highest part of the land behind their rafts. The spirits that villagers invite to stay in the spirit house are guardian spirits of the forest. Villagers of Hadpana only worship the spirit house on Buddhist days of worship with special food that villagers rarely eat in daily life, such as the dressed head of a pig. All members of the family will join in the worship ceremony and have lunch together after the worship is done. Normally, they worship the spirit as a means of asking for protection for their families or asking for the granting of a wish in return for thankful offerings (*Bon*). Villagers in the Hadpana community however do not use the spirit houses to wish for a plentiful catch from the guardian spirits; this aspect differs greatly from the more established and settled communities where villagers frequently wish for a successful catch from the spirits (Nit, Phe, Nam, Torn, Interview 23 November 2008). However, when Hadpana villagers can catch a Red-tailed Mystus (*Hemibagrus wyckioides*) weighing more than 20 kilograms, they will offer a flowery tassel to thank spirits who provided the giant fish.

In the context of the aquatic animal resource management, the belief system seems to play a minor role. In addition, the multiculturalism of people having different cultural roots is a questionable aspect for the success of the Hadpana community's management. However, instead of constructing a system based on cultural criteria, Hadpana villagers raised the common interests of villagers to be the key source of management that will be discussed later in the chapter V.

3.3.8 Economic Activities of the Hadpana Community

The physical features of the area, the base of resources available, and the environment of each area determines the economic activities of each community. Economic activity, therefore, is the management of the relationship between human and nature. Hadpana community is a community located in a reservoir surrounded by conserved forests; Hadpana's resources are therefore mainly aquatic animal resources and some kinds of forest products. Economic activities of Hadpana community are:

1. Fishery

Fishery is the most important economic activity of the Hadpana villagers since the physical features of Hadpana area have a high spatial potential for the freshwater fisheries in the area. Due to its location as a water source of the Srinakarin Reservoir with various types of sub-ecosystems, there are habitats for many kinds of fish.

Fisheries in the area of the Srinkarin Reservoir can be operated all year long, but from the rainy season until the end of the cool season is the best period to catch fish. Because of the variety of sub-ecosystems in Hadpana's area, fishers develop intellectual knowledge regarding fishery's methods for catching fish in specific locations and seasons, as well as for catching specific fish species.

Hadpana fishers use long-tailed boats with an engine of 8-15 horsepower as their vehicles for traveling around the Srinakarin Lake's area; there is no other choice for any other type of vehicle. Each family has at least one boat and may have more than one if the family has many members working in fisheries. For this reason, long-tailed boats are very important accessories for the fisherman's life.

The fishing gear used in Hadpana varies in accordance to differences in fishing areas and fish species living there. Moreover, there is diversification amongst fishing gear due to the fact that the fishing techniques of each fisherman involve adapting the fishing gear to be suitable to each condition. There are four common types of fishing gear that every family in Hadpana has, which are:

1. *Khai* or *Takad* (seine net)- *Khai* is the common drift grill net made from 8-18 centimeters of mesh that is tied with rope at the top and weighed down by a set of heavy rocks or a chain at the end. The size of *Khai* used varies amongst individual fishers, but usually they are about 8 x 8 meters. Fishers use *Khai* by

tying one side with a rope (call *Hu Khai*: Ear of seine net) to a tree or pillar, while the other side is weighted with a big rock and thrown into the water. Usually a floating marker made from plastic bottles is tied to the top as well to mark the point where the rope is tied.

2. *Lorb* is a fishing trap made of two rooms one smaller than another, with an opening at one end. There are two kinds of *Lorb*, *Lorb Yuen* and *Lorb Norn*, which are made for use in different types of areas.
3. *Yor* is a small raft with two poles extending into the water; these poles are controlled by a pulley that moves them up and down while holding a small meshed net under the water. Fishers light a neon light to lure fish inside the net and then slowly turn off the light and move the pulley to bring the net over the water to catch the fish.
4. *Bet Raw* (line-hook) is a series of hooks tied with very strong rope. *Bet Raw* uses the same method as *Khai* but differs in the sense that instead of using a net it utilizes a series of hooks. Both sides are bound with a rope to dead trees or pillars. Normally, this kind of fishing gear is used to catch specific species of carnivorous fish that are very large in size and weight.

Fish species in the Hadpana area are similar to those in the Mae Klong and Kwai Rivers (which are the water sources of the Srinakarin Reservoir). The report of the Department of Fisheries in 1997 (Supatra and Boonsong 1997: 27-29)[17] found that due to the fish species present in the Srinakarin Reservoir, the area is considered to be one of the most abundant areas in Thailand for fish species.

The table below provides a basic summary of the 18 fish species most commonly caught in the Hadpana area; the data were collected from fishers in Hadpana, they include the English name of the species, the scientific name, the local Thai name, and the size.

17 The research indicated that at least 55 species of fish are found in Srinakarin reservoir; however, from the field research found that more species are caught by fishers.

Table 3.1: The Most Common Species of Fish Caught in Hadpana Area

Common Name	**Scientific Name**	**Local Thai Name**	**Length**	**Weight**	**Picture**
Red-Tailed Mystus	*Hemibagrus wyckioides*	*Kung*	70-150 cm	40-50 kg	
Sheatfish	*Micronema apogoon*	*Dang*	70 cm	10 kg	
Sand Goby	*Oxyeleotris marmolata*	*Buu*	60 cm	5 kg	
Transverse-bar Barb	*Capoeta macrolepidota*	*Krasoob*	60 cm	4 kg	
Glass rasbora	*Corica goriognathus*	*Siu Kaew*,	5-8 cm	10 g	

Giant Snakehead Fish	*Channa micropeitis*	*Chado*	80 cm	9 kg	
Yellow Catfish	*Mystusfilamentus*	*Kod Luang*	50 cm	3kg	
Black Shark	*Labeo chrysophekadion*	*Ka Dam*	60 cm	6kg	
Nile Tilapia	*Oreochromis niloticus*	*Nil*	60 cm	4-5 kg	
Giant Gourami	*Osphronemus goramy*	*Rad*	60 cm	7kg	
Grey Featherback	*Notopterus notopterus*	*Salard*	25-30 cm	1kg	

Spotted Knife Fish	*Notopterus chitala*	*Krai*	80 cm	8-10 kg	
Feather-Finned Fish	*Notopterus barneensis*	*Satue*	100 cm	10-15 kg	
Striped Snakehead Fish	*Channa striata*	*Chon*	75 cm	2.5 kg.	
Striped Catfish	*Pangasius sutchi*	*Sawai*	100 cm	25-30 kg	
Common Silver Barb	*Puntius gonionotus*	*Tapien*	30 cm	2 kg	

Striped Tiger Nandid	*Pristolepis fasciatus*	*Mortaklab*	17 cm	500g	
Giant Bagarius	*Bagarius yarrelli*	*Khae*	150-200 cm	40-50 kg	

Fishery in the Hadpana area can be practiced all year, but the best time period for fishery is between July and January when the muddy water travels down from the water sources in the western forest complex and rain is frequent. During that period, many fish migrate from the main water sources, as they cannot resist the strong currents. Fishers will prepare to catch the fish that claim high rewards and are large in size such as the Giant Bagarius (*Bagarius yarrelli*), Red-Tailed Mystus (*Hemibagrus wyckioides*), and Sheatfish (*Micronema apogoon*). This is the golden period in which to earn a high income.

Fish trading is practiced at the trading raft of the community's leader; every fisher of Hadpana sells their fish here and the community's leader transfers all fish products to traders from other areas as well.

2. Fish Culture

Most of Hadpana's villagers have floating baskets (*Krachang*) that they keep close to their rafts for the purpose of raising fish. These fish are raised for two main purposes. Firstly, since Hadpana community was chosen to be a model fishing community, the community has to follow the Department of Fisheries' policy to practice aquatic animal restoration by raising various species of fish. The fish are provided by the Department of Fisheries and released into the water when they reach a certain size in order to increase the number of fish in the Srinakarin Reservoir. The

fish species raised for this purpose are Small Scale Mud Carp (*Cirrhimus microlepis Sauvage*), Rohu (*Labeo rohita*), and Seven-striped Bar Barb (*Probarbus jullieni Sauvage*). Secondly, villagers also raise some species of fish to sell at the trading raft. Some examples of fish species raised for this purpose are the Red-Tailed Mystus (*Hemibagrus wyckioides*), Sand Goby (*Oxyeleotris marmolata)*, Giant Snakehead Fish (*Channa micropeitis*), Yellow Catfish (*Mystusfilamentus*), and Striped Snakehead Fish (*Channa striatus*). Villagers typically choose a fish species that they feel will grow quickly and tolerate the environment well. Villagers typically raise the fish for 3 to 6 months before catching them to sell. Fish cultured in these floating baskets can provide a good income for the fishers and is the second most lucrative economic activity of the Hadpana community.

Figure 3.7: *Krachang* (Floating Baskets)

3. Hired Labor for Animal Husbandry

Villagers of Hadpana do not own animals like buffalo or bulls, but they do raise buffalos and bulls for financial backers who hire them. Villagers who do animal husbandry are mostly ethnic groups, i.e. Karen and Thai Yai, very few Thai people participate in this type of work.

The villagers will create a pen or fenced in area in which to maintain the animal's herd within a plain. They will then let the animal wander freely around that plain, without invading into the forest areas, during the day before driving the animal back into the pen in the evening. Since the villagers do not have to pay much attention to the animals, they get paid quite a low rate of 150-200 bath/day for raising them. These buffalos and bulls are not used in farming since Srinakrin Dam National Park

does not allow agriculture to be practiced in the park's area, but they are raised to sell for beef in the future. When the time has come and the animals have matured, villagers drive the animals onto a large metal raft to transfer them to the slaughterhouse in Kanchanaburi city.

4. Forest Product Gathering

According to the national park's regulations, gathering forest products and hunting are not allowed. However, the compromise between the Royal Forest Department's officers and Hadpana villagers provides opportunities for the villagers to utilize another source of income by allowing them to gather three forest products to sell. These forest products are *Nor Mai* (Bamboo Shoot), *Het Kon* (a kind of mushroom in the Termitophilae family whose scientific name is *Termitomyces fuliginosus Heim*) and *Phak Whan* (Melientha suavis). According to the villagers, during rainy season (May to September) that is the spawning season for fish, the Department of Fisheries limits the catch of fishers by prohibiting the use of many types of fishing gear. Hence, villagers of Hadpana cannot earn much income during the rainy season. Moreover, during the summer months, the weather and water conditions are typically not ideal for catching fish; therefore, villagers have to find alternative means for making money during these seasons. Villagers in the Hadpana community gather bamboo shoots and *Het Kon* in the rainy season, (June to September), while Melientha suavis is gathered during the summer season (February to April).

Melientha suavis grows very well in the dry summer months when there are forest fires; after the rain falls, the plants grow rapidly. Melientha suavis is typically located in the deep forest areas, therefore villagers have to travel for half a day just to find its location, but it is well worth the trip for the quantity and the price that can be gathered from just one trips harvest. Hadpana villagers can gather Melientha suavis in averages of up to 7-10 kg per one trip, and for some strong villagers who are able to find the prosperous areas, 15 kg is not an unheard of amount to gather in one day. Because of the sweet taste of *Phak Whan*, the demand from consumers is very high. Moreover, *Phak Whan* from forests is considered to be more delicious than that grown in vegetable beds; therefore, this kind of vegetable is sold for 50-60 bath/kg. *Het Kon*

is another forest product that can be harvested to create income for the villagers. *Het Kon*'s can be sold for up to 300-400 bath per kilogram and is under high demand during its season due to its desirable taste. Not many villagers know how to gather this kind of mushroom as it requires a specialized knowledge to find its gathering spots. Good mushroom gatherers can gather an average of 5-10 kilogram during one trip; this is an excellent source of income for them. *Nor Mai* or bamboo shoot is also a good source of income for villagers. The going price per kilo of bamboo shoots is quite low compared to the other mentioned crops, but it is much easier to gather. Villagers normally gather bamboo shoots in groups of 5-10 people in order to carry large quantities of bamboo shoots out of the forest. In just one trip, villagers can gather about 50-100 kilograms of bamboo shoots to sell at a rate of 15-20 Baht per kilogram.

However, the permission to gather forest products is solely a deal between the Royal Forest Department's officers and the villagers as it is totally against the law. Officers allow villagers to gather temporarily because forest product gathering is another means of earning income for the villagers when they cannot catch many fish; however, the officers can prohibit gathering at anytime without any advance announcement, but they will always warn villagers before arrest. The management toward forest product gathering represents the relationship between state officers and villagers in a way that illustrates how they do make compromises in their own practices. Officers give permission to gather only general forest products, such as vegetables, and mushrooms that are found easily, but they strictly prohibit villagers to gather other products beyond these. At the same time, villagers know that being granted permission to gather these products is solely a compromise made by the officers; therefore, they do not break any rules given by the officers in order to maintain the possibility of these opportunities in the future. In other words, officers can easily control the level of forest product gathering by this compromise with the villagers.

In conclusion, forest product gathering is an alternative livelihood which is important to Hadpana villagers as it can be a lucrative source of income for the villagers during times when fishing is not lucrative enough.

5. Handicraft

Handicraft is another economic activity practiced by a minority of the Hadpana community. The production of handicrafts requires craftsmanship and skill, therefore not all villagers can produce these products, but it is a very good source of income for villagers who have this ability. The handicrafts that Hadpana villagers make are mostly types of fishing gear and accessories such as fish traps and paddles which villagers commonly order for use within the community. Furthermore, in the case that they cannot sell their products, they can use them for their own fishery, or send the products to sell outside the community as well. Moreover, there are many times that beautiful paddles crafted by villagers are bought by tourists as souvenirs.

Figure 3.8: Hand-Made Paddles of Hadpana Villagers

The economic activities of the Hadpana community are represented by the annual calendar below:

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Fishery - Common species - Migrated Species	←											→
2. Fish Culture	←											→
3. Fish Trade	←											→
4. Animal Husbandry	←											→
5. Forest Product Gathering - Bamboo Shoot - Melientha suavis - *Het Kon*		←		→		←			→	←		→
6. Handicrafts	←											→

Table 3.2: The economic activities of the Hadpana community

3.3.8 Intellectuals in the Way of Life

Since fish do not live in every area of the 419 square kilometers of the Srinakarin Reservoir, fisheries within a vast area like this depend highly on the knowledge of fishers to operate successfully. Knowledge regarding the fish's behaviors, habitats, and food consumption are key areas of interest for fishers. Simultaneously, knowledge regarding the physical features of the space where fishers practice their fisheries is also very important. Due to the differences within each area, intellectuals on freshwater fisheries must study each area; therefore, their knowledge is based on experience and information obtained from villagers living in the area.

There are three main categories of local knowledge on fisheries of Hadpana villagers.

1. Knowledge regarding the ecosystem and space having potential to house fisheries in the area.
2. Knowledge of habitats, behaviors, and food consumption of the fish species.
3. Knowledge regarding the use of appropriate fishing gear for different fish species and different sub-ecosystems.

According to these three main intellectuals areas, they represent the relationship between humans (as a community) and the resource system (fish) in a way that illustrates how humans use social and cultural processes to create their way of life and transmit knowledge to the next generations systematically. From the interviews taken with many fishers, it was stated that villagers transmit this knowledge system on to their youths and teach them through practice and real experiences. For this reason, most teenagers living in Hadpana know how to drive long-tailed boats and can fish quite well. Hadpana villagers share these types of knowledge with the youth not only to teach them to use aquatic animal resources effectively, but also to transmit the idea of resource conservation as a community's regulation to their youth and follow the policies of a model fishing community at the same time.

1. Community knowledge towards fish species

From the research of Supatra and Boonsong (1997) it was found that at least 55 species of fish are living in the Srinakarin reservoir; however, there are actually more species of fish and aquatic animals in the reservoir as the Hadpana villagers insist that many species are not included in the list. Most of the Hadpana villagers already had a basic knowledge of fishery that they adapted to be used in practice within the Srinakarin reservoir after they relocated to the area. Nevertheless, they need additional experience to improve their skills and learn more about the space and the nature of fish in the area since the conditions of fisheries vary by the space (Nit, Phra, interview 25 November 2008).

The knowledge regarding fish species amongst the villagers consists of that which regards habitat, spawning grounds, behavior and food consumption, all of which varies amongst each species of fish. Hadpana villagers must know the fish's

behavior and their eating habits in order to find the most appropriate places to place the fishing gear. This kind of knowledge will be very obvious when villagers use luring gears like *Bet Raw*; the bait they use will be specified for effectiveness to the catch of a certain kind of fish. For example, hooking Bet Raw with *Pla Kayang* to lure the Giant Snakehead fish or hooking *Pla Kayok* for the Red-tailed Mystus. The accomplished fishers will be well versed in these details in order to create more opportunities for a productive catch for themselves.

The detail of habitat is related to the sub-ecosystem of the Hadpana area; so it will be presented in the community's knowledge towards the area's ecosystem. The spawning grounds of fish, according to the community's knowledge, are mostly at the water sources over *Ong Thang*. Villagers also consider the *Huay* (streams) to be common spawning grounds for fish as well. Villagers explained that it is natural for big fish to go against the tide during the spawning season to spawn at the water sources or streams where the water is moving (Nit, Phae, Nam, Torn 25 November 2008). Therefore, these areas must be protected during spawning season to avoid highly negative effects to the species caused by the fisheries practice. The community knowledge further indicated that some fish species, like Giant Snakehead Fish (*Channa micropeitis*) and Striped Snakehead Fish (*Channa striatus*), build their nests in the still water areas not far from the shore and use these areas as their spawning grounds. The fish like Striped Tiger Nandid (*Pristolepis fasciatus*), Giant Gourami *(Osphronemus goramy*), and Nile Tilapia (*Oreochromis niloticus*) also spawn in the Stillwater areas close to weeds, trees, and sunken logs to protect the eggs and juveniles.

The knowledge of fish migration is also important for fishery practice. Villagers of Hadpana indicated that fish will migrate upstream to spawn during spawning season (May to September) and dry season (March to May) and they will migrate downstream during the rainy season that has very high amounts of rainfall not allowing the fish to swim against the tide (September to February). The two important migrating fish species are Sheatfish (*Micronema apogoon*) and Giant Bagarius (*Bagarius yarrelli*), which are caught seasonal only during their migration period (Nit, Phae, Nam, Torn 25 November 2008).

Hadpana villagers have knowledge of the fish species and the natural resources that they use as a means of improving their catch as a primary objective; however, the knowledge is also very useful when villagers utilize the information to be used in resource management since they are able to draw upon their personal experiences to manage the aquatic animal resources in a sustainable way.

Moreover, the community's knowledge regarding fish species assists Hadpana villagers in choosing the fish species to be raised in the floating baskets. They learned through their own experiences that there are only some fish that are the most appropriate to be raised in the conditions of the Hadpana community. Fish species like Nile Tilapia (*Oreochromis niloticus*), Giant Gourami *(Osphronemus goramy*) introduced by the Department of Fisheries and a private company (concealed name) to be raised in the baskets are not accepted by villagers since they found that they are too weak to tolerate the tide and weather conditions of the area. Moreover, the fish also grow very slowly and this is not worth the investment of time for the villagers. Therefore, villagers chose to raise Yellow Catfish (*Mystusfilamentus*), Red-Tailed Mystus (*Hemibagrus wyckioides*), Striped Snakehead Fish (*Channa striatus*), and Giant Snakehead Fish (*Channa micropeitis*) according to their own knowledge. The chemical substances used to cure fish diseased is also denied by the villagers since they found that the *Ka Thok Rok* (Passion Fruit) is a more effective substance for curing the fish than the chemical substances that further created pollution within the water.

The community's knowledge regarding fish species and their nature is important for Hadpana villagers to establish the regulations and determine the ways of management. If villagers do not have their own knowledge base to draw upon, it is highly possible that they will not participate fully in the management of the community but only follow the ways of the aquatic animal resource management designated by the Department of Fisheries.

2. Community knowledge towards the area's ecosystem

Fishers need to learn about the nature of the fishing grounds including the sub-ecosystems, water level, and seasons in order to make a good catch. Though Hadpana's area encompasses only 5 kilometers of distance, it has various

characteristics within the space that create high potential for fisheries. As mentioned above, Hadpana villagers normally use *Khai* (seine net) and *Bet Raw* (line hook) as the main types of fishing gear used to catch big fish that carry a high price. Big fish like Red-tailed Mystus (*Hemibagrus wyckioides),* Striped Catfish (*Pangasius sutchi*) and Sheatfish (*Micronema apogoon*) naturally live in water channels that have a depth of at least 10 meters. Villagers are very knowledgeable about the water channels in the area and with their intellectual abilities gained from nature they can further predict where water channels are outside of the area as well (Phra and Nit, Interview 17 Oct. 2008).

The knowledge of the sub-ecosystem helps the villagers greatly to understand the characteristics of the fishing space, what kinds of fish are living there, and which fishing gear would be most appropriate to use in each sub-ecosystem. Hadpana villagers name their sub-ecosystems with names that have the same meaning as general words. For example, the sub-ecosystems could be categorized into:

1. *Huay* (Stream, Creek): Little streams originating from water sources on mountains in the western forest complex. Water from the source flows into the Srinakarin Lake during the rainy and cool season seasons creating a current of running water. Usually, *Huay* will dry up in the summer months when the mountains sources do not provide strong enough currents for the small streams to flow downward.

Figure 3.9: *Huay* (Stream)

2. *Tham* (Cave): Hole within rocky cliffs or mountains eroded by wind and current. Some *Tham* are exposed over the water while some are hidden under the water.

3. *Hin, Pha* (Cliff, Rock): Before flooding, this sub-ecosystem was a rocky mountain; however, after the forest complex sank underwater, it became a rocky cliff standing along the bank. *Tham* is commonly found within *Pha.*

Figure 3.10: *Pha* (Cliff)

4. *Had* (Beach): *Hadpana* has only one beach which is the origin for the name of the community. *Had* is a sandy or rocky beach that slopes into the lake.
5. *Hub* (Ravine): *Hub* is a small wetland area extending into the land. The area was typically a slope of hills or mountains before flooding. Some *Hub* are linked with *Huay* and house running water within the space.
6. *Koh* (Island): *Koh* was the highland area or hilltop area of the mountains prior to the flooding. These areas are exposed over the water as small islands with grass and plants growing on the top of them. The area of land beneath the water always has many dead trees that provide a perfect habitat for both tiny and carnivorous species of fish.

Figure 3.11: *Koh* (Island) on the right side of the picture. Many dead trees standing around provide a good habitat for fish.

7. *Ao* (Inlet): Similar to *Hub*, but *Ao* has a vaster area of wetland extending in towards the land. These areas are full of weeds and plants and act as a source of food and habitat for the fish.
8. *Rong Nam* (Channel of Water): Fishers consider this to be the most effective space for fisheries. *Rong Na*m is a track of water more than 10 meters in depth. The bottom of this water channel provides suitable conditions necessary for fish to live. This area is also the path for migrating fish; many big fish like Giant Bagarius, and Redtail Mystus of 10-60 kg are commonly found in this channel of water.

Figure 3.12: *Rong Nam* (Channel of Water): it cannot be seen, but fishers know where it is.

This set of sub-ecosystem names assists villagers in marking their own landmarks for the purpose of memorizing the good fishing spots. Each spot has its own characteristics that attract various kinds of fish. The water channels are not the only places for good fishing; the other sub-ecosystems also have their own characteristics making them suitable for other methods of fishery. The sub-ecosystems close to the shore have mostly still water (except during the rainy season), and sub-ecosystems like *Hub*, *Huay*, and *Had* are home to specific kinds of fish that cannot be caught in the water channels. The fish species living in these sub-ecosystems are mostly small to medium sized fish such as Common Silver Barb (*Puntius gonionotus*), Striped Snakehead Fish (*Channa striatus*), Striped Tiger Nandid (*Pristolepis fasciatus*), Grey Featherback (*Notopterus notopterus*), Giant Gourami *(Osphronemus goramy*), and Sand Goby (*Oxyeleotris marmolata)*; moreover, there are carnivorous fish like Transverse-bar Barb (*Capoeta*

macrolepidota) and Giant Snakehead Fish (*Channa micropeitis*) hunted in these areas as well.

Knowledge of fisherman regarding sub-ecosystems is absolutely necessary for the effectiveness of the catch. Learning about these sub-ecosystems and the fish's nature is also important in order to avoid harming the fish habitats and spawning grounds that are necessary to maintain sustainable fishery in the area.

Seasons are also of critical importance for operating fisheries. The best fishing season in Hadpana begins when *Nam Dang* (muddy water) from the water sources in the mountain ranges flows downward into the Srinakarin Reservoir and continues throughout the end of the cool season. During this season, water in the Srinakarin Lake will flow as a current creating good conditions for fisheries, villagers mentioned that when muddy water flows from the source, the fish cannot resist the strong current and swim upstream. Therefore, they will gather within the Hadpana area, as it is the closest fishing area to the water source. Moreover, there are also migrating fish that are found seasonally such as Sheatfish (*Micronema apogoon*) and Giant Bagarius (*Bagarius yarrelli*). Normally, Srinakarin Dam distributes water during the summer and creates a low level of water within the reservoir; therefore, in the consecutive rainy season Srinakarin Reservoir has lower water levels that limit the space for fish and enable the fishers to catch them easily. The amount of rainfall during the rainy season fulfills the water in the reservoir and the level becomes high again in the cool season. Following the cool season, villagers know that the golden period for fisheries has come to an end; after this, they will only be able to catch enough fish to live their lives.

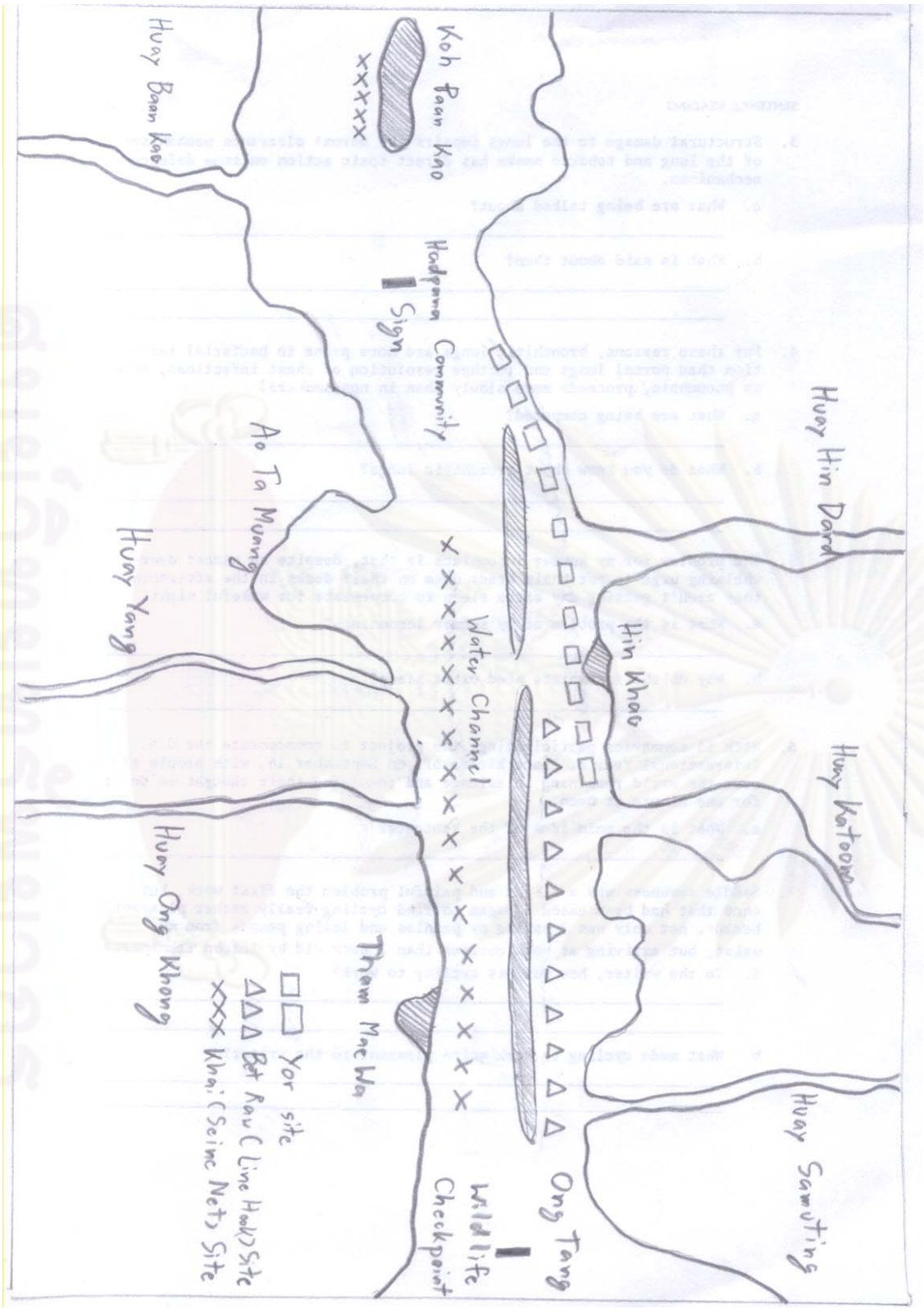

Figure 3.13: The important landmarks and fishing spots of the Hadpana area.
(Hand-drawn by researcher)

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3. Community Knowledge Regarding the Fishing Gears

Because of the variations of space and fish species within the area, the environment determines the most appropriate mode of fishing. Physical features of the space and fish species determine the kinds of fishing gear and the mode of fishing as there is no fishing gear can be used to catch all kinds of fish or in all characteristics of space. The gear used in Hadpana can be categorized into 4 kinds of gear that are:

3.1. Trapping gear

This kind of gear is the primary gear used in the area. There are three types of gear categorized under this sub-category that are *Khai*, *Lorb*, and *Yor*. *Khai* (seine net), is the common drift grill-net which has a mesh section of 8-18 centimeters tied with a rope at the top. The size of *Khai* varies amongst individual fisherman, but usually is within the range of 8x8 meters. Fishers use *Khai* by binding one side with a rope (called *Hu Khai*: ear of seine net) to a tree or pillar, and tie the other end to a rock which is thrown into the water. Typically, floats made from plastic bottles or foam are tied to the ropes to mark the point of the ropes end and keep afloat the upper area in order to stretch the net. The under side is weighted down by metal chains or weights made from malleable metals forcing the net to spread in the water. One *Khai* has 50 meshes; when used normally, fishers use 3-4 *Khai* in one place. However, some fishers use approximately 20-30 *Khai* per day.

Khai has two methods of use; one is called *Khai Pae* (shallow seine net) used near banks and comprised of small mesh ranging from 8-10 centimeters to trap medium scaled fish such as Nile Tilapia or Common Silver Barb. The second type is called *Khai Klang Nam* (mid-water seine net). This kind of seine net is normally used in many varieties of space such as *Koh*, *Pha*, and *Rong Nam* that have more substantial levels of water. Because of the size of the net and the mesh, *Khai Klang nam* tends to trap big fish such as Sheatfish (*Micronema apogoon*), Red-Tailed Mystus (*Hemibagrus wyckioides*), and Striped Catfish (*Pangasius sutchi*). Villagers typically tie seine nets in place from 6 a.m. until midday, then return to their raft to eat and rest before going to place the second round of nets between 2 p.m. and 6 p.m. The following day they will return to collect the fish from the seine nets. Fishers use their *Khai* for about two years before replacing them as it takes approximately this much use before they cannot be fixed anymore; however, *Khai Pae* that are used near the

banks last for a much shorter period of time than *Khai Klang Nam* since they frequently get tangled amongst the dead trees under the water. Fishers normally replace their *Khai Pae* every 3 months. The price of one seine net of 50 meshes is approximately 270-280 baht.

Lorb is a trap with two rooms, one smaller than another, and an opening at the end. Fishers in Hadpana use this kind of fishing gear typically to trap yellow catfish. *Lorb* is usually used in *Koh*, *Pha*, and *Tham* due to the fact that the high depths are considered to be ideal habitats for catfish. Some fishers also place small dead fish in the *Lorb* creating a smell that lures the catfish as they use their sense of smell to find their food. Fishers also use *Lorb* in shallow water by adapting the size and the rooms called *Lorb Yuen* to trap smaller fish living near the banks and shores; the place of use is different, but the method is the same.

Yor is a small raft with two poles extending into the water. These poles are controlled by a pulley that moves them up and down and holds a small-meshed net in the water. Fishers light neon lights to lure the fish inside the net and then slowly turn off the light and move the pulley to place the net over the water. Some fishers also put fish meat in the nets to lure the fish inside. Normally, this gear is used to catch tiny fish like Scissor-tailed Rasbora (*Rasbora trilineata*) and small scaled-fish. Fish species typically caught by *Yor* are too small to sell at a fish-trading raft; therefore, fishers use them to cook, make bait for hooking larger fish, and for feeding fish in the floating baskets. This kind of fishing gear is not effective for catching economic sized fish at all.

3.2. Luring gear

Bet Raw (line-hook) is another main fishing gear used by Hadpana's fishers. The use is the same as *Khai*, but changes from a net to a series of hooks. The rope tied with the hooks must be thick enough to maintain the weight and withstand the movement of the fish. *Bet Raw* is mainly used to catch gigantic carnivorous fish with live bait like minnows, frogs, and shrimp. These species of fish are so big that they can tear the seine net just by moving their bodies. This method is used around the channel of water that has a depth of 15-20 meters and is a thoroughfare for large migrating fish such as Sheatfish (*Micronema apogoon*), Giant Bagarius (*Bagarius yarrelli*), and non-migrating fish such as Red-Tailed Mystus (*Hemibagrus*

wyckioides), and Feather-Finned Fish (*Notopterus barneensis*), which can weigh between 10 and 50 kilograms.

Bet Raw is usually used from July to November, as it is the peak period for catching big fish. Some years during this period, schools of yellow catfish will gather at Hadpana. The fishers use smaller hooks and shrimp as bait to fish the yellow catfish with *Bet Raw*; these fish can be extremely lucrative.

3.3. Catching Gear

This kind of gear is rarely use in the area, but is very effective for some specific purposes such as using *Sawing* (hand-net) to catch Striped snakehead fish and Giant snakehead fish's juveniles, or for using *Puen* (gun) to shoot for Giant Gourami, Nile tilapia and Giant Snakehead fish in small areas with too many obstructions for the seine net to be used effectively.

3.4. Accessories

Fishers of *Hadpana* use long-tailed boats with 5-13 horse power engines as a fishing accessory and vehicle. Knives and baskets are essential accessories as well.

Figure 3.14: Common Fishing Gears Using in Hadpana Community

Khai

Bet Raw

Yor

Lorb

Long-tailed Boat

The quality of a fishing space is determined by the density of fish within the area in terms of both quantity and quality. Naturally, each fish has different behaviors and desired habitats. To choose appropriate fishing gear for a space and species is very important. In the case of *Hadpana*, fishers consider the space within the water Channel from *Ong Thang* wildlife checkpoint to *Huay Kratum* to be the best fishing area. This water channel is around 15 meters in depth, and is full of many huge and lucrative species of fish. Therefore, fishers primarily operate fisheries within this area. If fishers want to find some Rasbora, they have to put their *Yor* near the shore in front of *Hin Khao,* which is the space having the highest potential for practicing fisheries with *Yor*. Another water channel, with a depth of more than 20 meters running from *Ong Thang* wildlife checkpoint to *Hin Khao* is also considered to be an area of high potential for practicing fisheries with *Bet Raw* (line hook). Banks and Shores are also effective places for some methods of fishing such as *Lorb Yuen* and *Khai Pae*. There are many *Huay* and *Ao* in the Hadpana area such as *Huay Ongkhong*, *Ao Tamuang*, and *Huay Samuting* where such methods can be ideal.

The table below categorizes relations between fish species, their habitats, and fishing gear. This information represents information regarding the operation of fisheries within the Hadpana area and can be used as a source of influence for fishers to utilize the most suitable and effective methods of fishing.

In conclusion, the community's knowledge plays an important role in the participatory aquatic animal resource management of the villagers since the community knowledge will be the grounds drawn upon to represent the level of the villagers' participation in practice, i.e. the more knowledge they contribute, the higher their level of participation.

Table 3.3: The relations between fish species, their habitats, and fishing gear

Fish Species	**Habitat**	**Fishing Gears**
Red-Tailed Mystus	*Hin, Pha, Koh, Rongnam*	*Puen, Khai, Bet Raw, Lorb*
Sheatfish	*Rongnam*	*Bet Raw, Khai*
Sand Goby	*Hin, Pha, Rongnam*	*Khai Pae*
Transverse-bar Barb	*Hin, Pha, Koh, Taling* (Bank), *Rongnam*	*Khai, Bet Raw*
Rasbora	*Ao, Taling* (Bank), *Rongnam*	*Yor*
Giant Snakehead Fish	*Tham, Hub, Koh, Had, Taling* (Bank)	*Puen, Bet Raw, Sawing* (juvenile)
Yellow Catfish	*Tham, Hin, Pha, Koh, Rongnam*	*Khai, Bet Raw, Lorb*
Black Shark	*Hin, Pha, Koh, Rongnam*	*Khai*
Nile Tilapia	*Huay, Ao*	*Khai, Puen*
Giant Gourami	*Huay, Ao*	*Puen, Bet Raw*
Spotted Knife Fish	*Had, Rongnam*	*Khai, Bet Raw*
Feather-Finned Fish	*Rongnam*	*Bet Raw*
Grey Featherback	*Huay, Taling* (Bank), *Had*	*Khai Pae, Khai, Lorb Yuen*
Striped Catfish	*Rongnam*	*Khai, Bet Raw*
Striped Tiger Nandid	*Huay, Taling* (Bank), *Ao*	*Khai Pae, Lorb Yuen, Puen*
Common Silver Barb	*Huay, Taling* (Bank), *Hub, Ao, Rongnam*	*Khai Pae, Khai, Yor, Lorb Yuen*
Striped Snakehead Fish	*Huay, Taling* (Bank), *Hub, Ao*	*Puen, Bet Raw, Khai Pae, Sha-muak* (Spear), *Sawing* (juvenile)
Giant Bagarius	*Rongnam*	*Bet Raw*

CHAPTER IV

DEVELOPMENT OF HADPANA AQUATIC ANIMAL RESOURCE MANAGEMENT

4.1 From Destructive to Sustainable Fishery

Prior to the spread of the conservative movement approximately from 1960 to 1972 and the increase in aquatic animal research in Thai society, Thai people maintained the mentality that “there is rice in the field, there are fish in the water”. Fishery at this time was about how to catch as many aquatic animals as possible in order to be worth the investment of time. Aquatic animal resources drastically decreased in response to the development of fishing gear capable of catching many animals at a time for the purpose of commercial fishery. In the year 1997, the conservative movement began to control the overuse of resources (Santita, 2000: 281-282).

In the past, many freshwater fishers used destructive methods of fishing to catch many fish without taking into consideration any of the consequences of these practices. Bombs, poison, Electric Shock and small-meshed seine nets were widely used in natural water sources all around the country. In the case of the Srinakarin Reservoir, these methods were widely used by fishers. These four methods of fishing have highly negative effects on not only aquatic animals and the environment, but also on consumers. Bombing destroys both fish habitats and the ecosystem of the water. The explosions can transform underwater ecosystems into an environment where fish can no longer live. Moreover, using bombs kills all kinds of animals within the distance of the explosion, meaning that juvenile animals and non-economic animals are also killed by this practice. Putting poison into the water and using electric shock also causes negative effects similar to those caused by the bombs. Though the poison and electric shock are used only to temporarily knock the fish unconscious, and not actually kill them, the effect is much stronger than the fishers anticipated. Many fishers insist that the fishing spots that have been bombed, electric shocked, and poisoned have not had any fish living in them subsequently for a

substantial amount of time. Therefore, most of the fishers are against these methods of fishing, and the Department of Fisheries also considers them to be illegal. The use of small-meshed seine nets is not illegal according to the Department of Fisheries, but is considered to be a destructive type of fishing gear since fish juveniles cannot escape from it; the use therefore creates unnecessary loss.

In the case of the Hadpana area from the early age of settlement to around 1999, destructive fisheries practiced by fishers both living inside and outside the area caused much destruction due to the fact that the area itself is not that vast, and it is a water source and spawning ground for many species of fish. When people began to practice fisheries inside the Srinakarin Reservoir, many fishers used these kinds of methods, especially bombing and electric shock, to catch fish because it created a good yield with very little investment. Fishery patrol arrested many of them, but they still practiced these methods secretly at night. Following the destructiveness of these fishing methods, villagers began to realize that they were catching fewer fish than they had previously. Moreover, the sites where bombs and electric shock were employed are at this time still empty of fish. Together with the conservative movement, the Department of Fisheries began to take more serious actions towards the control of destructive fishery in the natural waters in order to conserve aquatic animal resources. The consequence was that many fishers were arrested, fined by the fishery patrol, and their boats and accessories were seized as physical evidence. Being arrested, fined, and the seizure of their boats is a big problem for fishers whose lives depend upon their fishing income. The fisherman further find it to be very hard to pay the amount of money charged for illegal fishing. For this reason, many fishers in the Hadpana area have stopped practicing destructive fishery, as the result is not worth the risk. However, though officers work diligently to control these destructive fisheries, some fishers still operate fisheries that practice these methods.

The Hadpana area was becoming highly affected by these types of destruction. The villagers of Hadpana therefore gathered together in an attempt to control destructive methods. Firstly, the villagers began by organizing meetings within the community to educate villagers about the consequences of using bombs, poison, electric shock, and small-meshed seine nets. They illustrated that the use of these types of fishing gear would destroy so many fish and habitats that there would be no

more fish in the future. Villagers could already see the results of these destructive methods through their own observations; therefore, most of them willingly accepted these regulations. Since bombing, electric shocking and poisoning is illegal according to the Department of Fisheries, villagers raised their level of control within the community by informing the fishery patrol every time they saw destructive fishing methods being practiced within the Hadpana area, sometimes arresting and bringing those fishers to the officers by themselves. This was the beginning of destructive fishery prohibition in the Hadpana area prior to the community itself becoming a model fishing community.[18]

Hadpana community became a model fishing community in 2007. Prior to that, the Department of Fisheries officers frequently came to the community to collect data. The officers informed villagers about the principles of the model fishing community in order to create a common understanding and began their project by bringing fish into the community to breed in floating baskets. Fish species firstly brought to Hadpana were Seven-striped Barb (*Probabus jullieni*), Mud Carp (*Cirrhina microlepis*), Rohu (*Labeo rhita*) and Giant Freshwater Prawn (*Macrobrachium rosenbergii*). These fish were raised in the floating baskets of the community's leader. The first generation of these fish was released into the water in 2008, and villagers caught some of them with weights of about 1.5-2 kilograms. The fish bred in the baskets were later called *The Aquatic Animal Restoration Project*, (โครงการฟื้นฟูสัตว์น้ำหน้าบ้าน), and were presented as the first activity of the Hadpana community as a model fishing community. Furthermore, the community began to develop itself by training villagers, creating regulations, excluding external fishers and working towards developing and establishing a model fishing community that could conserve aquatic animal resources through the practice of sustainable fishery.

[18] However, the year when destructive fishery prohibition began is not recorded.

Figure 4.1: The sign of *The Aquatic Animal Restoration Project*

4.2 Hadpana Community as a Model Fishing Community

Established as a community of rafts for almost 30 years, having experienced both abundant and impoverished periods, Hadpana community was finally instituted to be a model fishing community in order to maintain aquatic animal resources. The Hadpana community is now considered to be one of the most abundant fishing sites in the opinion of the Srinakarin Reservoir's fishers. The determination of the Hadpana villagers was the origin and inspiration behind the practices to control destructive and over-fishing in the area. These practices have been further developed by the Department of Fisheries through their organization and establishment of a model fishing community project including Hadpana as one of the project sites.

The establishment of the model fishing community project follows the principles of the community-based fishery management concept by acknowledging that effective aquatic animal resource management cannot be successful without real participation from local communities. Local community's participation; therefore, is the essence of this project. The key to succeed in aquatic animal resource management is to construct thoughts and understanding while leading to practices within the fishing communities that consider aquatic animal resources to belong to the fishing communities themselves. Hence, the communities must manage the resources by themselves (Fisheries Management Department 2008).

As mentioned previously, Hadpana community, before it became a model fishing community, was researched by officers from the Department of Fisheries and

by many Universities such as Kasetsart University and Kanchanaburi Rajabhat University in order to study physical features of the area and determine if the community was appropriate for establishing the project or not. According to the documents presented by the Department of Fisheries regarding the establishment of model fishing community projects, it stated that the criteria for finding appropriate communities to establish model fishing communities must consider the following compositions: occupation, community leader, geographical features, base of fishery resources, villager's participation, economy, society and culture of the community, involved laws and regulations, and background information or database (Fisheries Management Department 2008).

Drawing from an interview with the community leader and community committees, the Department of Fisheries mentioned that the main reasons Hadpana community was chosen to be a part of this project was due to a combination of features;

1. Its geographical feature as a water source of the Srinakarin Reservoir, where fish naturally live and breed, is an ideal factor for the success of this project.

2. Because of its settlement close to the water source, over-fishing in this area undoubtedly affects the number of fish in all areas of the Srinakarin Reservoir, (Waipot, Nit, Phra, Interview: 25 November 2008). Hadpana area is therefore a very important location for the Department of Fisheries to consider as a site to establish a model fishing community. 3. Apart from the geographical features of the area, the co-operation amongst villagers to attempt to terminate destructive fishing in the area is under the supervision of the Department of Fisheries' officers. The determination they willingly displayed through their activities is another reason indicating to the Department of Fisheries their potential to manage aquatic animal resources (Waipot, Nit, Phra, Interview: 25 November 2008).

Following its transformation from a normal group of fishers living in the same area and managing their aquatic animal resources by themselves, to a community under the establishment of the model fishing community project, Hadpana community gained legal rights according to the Thai constitution B.E. 2540 and 2550, and power from the state unit by the Department of Fisheries as the representative to manage aquatic animal resources more effectively according to the community-based fishery

management principles. Subsequently, these rights and the power of the Hadpana community also came with greater responsibilities for the model fishing community to take care of its aquatic animal resources in the area more strictly than fishing communities in other areas. Conscience instruction for the community's members is necessary to indicate that the importance of the conservation of the area's resources for sustainable fishery in the future is the responsibility of the fishing community who is the owner of the aquatic animal resources in the area. The Department of Fisheries' officers, university scholars, and respected people in the community who participated in the project continuously emphasize in meetings regarding the rights, duties, and responsibilities of a model fishing community that villagers themselves have to participate in aquatic animal resource management. The villagers must consciously understand the importance and necessity of conservation and the modes of resource management in order to maintain abundant aquatic animal resources for sustainable fisheries in the Srinakarin Reservoir area.

4.3 Participatory Aquatic Animal Resource Management in the Hadpana Area

The participatory aquatic animal resource management is the resource management by a local community given rights and power to manage the resource within the community's area. The fishing community's status is changed from that of the user, to that of the owner, which does not only use but also has the responsibility to take care of and maintain the resources under conditions allowing for the well-being of community's villagers and sustainable fishery development. The role of the state becomes one of only facilitators to the fishing community. The aquatic animal resource management in general uses the criteria of fishery management such as area closure, seasonal closure, mesh size limits, and catch quota or fishing gears restriction. These criteria are determined from the state as the top-down policy under the conditions of Fishery Biology and fishery economics to practice fisheries aimed at creating maximum sustainable yield and maximum economic yield. However, when the management turns to be participatory, the community's rights over aquatic animal resources is considered to be the most important factor i.e. fishing communities establish policies to manage the resources by themselves.

4.3.1 The Participation of Villagers in Aquatic Animal Resource Management

The essence and goal of the establishment of a model fishing community is to create a fishing community that can manage its own aquatic animal resources in the area. The Department of Fisheries' officers who previously took charge in the management will ideally change their status to be only facilitators as time goes on and the community becomes established. The process of the Department of Fisheries follows the concept of "Understanding, Approaching, Developing" (*Khao Jai, Khao Thung, Pattana*) that is:

- Approaching community: working through public relations to construct knowledge and understanding amongst fishers, community leaders, and local administrations as well as collecting research regarding the community's data.
- Building trust and adjust thoughts constructively: officers must participate in the community's activities and offer assistance to friends of the community in all development activities. They should further organize meetings and exchanges for the purpose of exchanging opinions amongst both scholars and the community's experts.
- Participation in aquatic animal resource management's creation: the officers together with the villagers co-operate and agree on ways to manage the aquatic animal resources in the community by raising the villager's status to be the main decision maker. Furthermore, they co-operate in planning the aquatic animal resource management by using the community's ideas as the dividend.
- The establishment of a model fishing community: bring the plan to action in practice by organizing villagers to manage the aquatic animal resources by electing administrations, creating community regulations, and taking part in all activities such as patrolling the fisheries in the area with the officers, creating conservative zones, releasing aquatic animals, etc.

Hadpana community has already passed through all of these processes and is now developing in the final stage of establishing an organization to manage the aquatic animal resources. From the interviews with many villagers, it is frequently stated that the Department of Fisheries officers came to Hadpana quite often in the

first stage of the establishment of the project. The officers visited the community in order to complete the two objectives of conducting research investigating the community's potential to develop into a fishing community and for the purpose of informing and sharing knowledge regarding participatory aquatic animal resource management with the villagers. The details of which were knowledge regarding the negative effects of destructive fisheries and over-fishing that directly affects the villagers, and the principles of community-based fishery management in order to create an understanding amongst villagers that the real people responsible for aquatic animal resource management must be the ones who use the resources themselves. The cooperation between officers and villagers began at this time and has continued since then. Again, the Department of Fisheries officers showed their determination and understanding to the villagers creating a strong relationship amongst them that is very useful for the resource management.

One of the very first steps in controlling fisheries in the Hadpana area in a way that is in concordant with sustainable fishery lies in the creation of regulations. The establishment of regulations is mainly based on the opinions of villagers who have been living in the area for a long time and have a strong knowledge of the space and fisheries in the area. The officers are eventually transformed to play only the role of facilitators who offer advice, opinions and comments. The regulations established by the Hadpana villagers are:

1. *Khai* or *Takad* (seine net) used within the Hadpana area must have a mesh size bigger than 7 centimeters to avoid catching too small of fish. The community leader who owns the fish trading raft will not buy any fish caught by seine nets with small mesh sizes and villagers will keep an eye on one another to help control the use of small meshed seine nets--informing the leader if anyone is suspected to be catching fish with small meshed seine nets. The size of seine net restriction is based on the agreement amongst villagers according to the community's knowledge regarding the fish species to choose the most appropriate size to avoid catching small and non-economic fish that causes unnecessary lost.

However, this regulation has an exception that each fisherman can use 5 seine nets in order to catch fish to be used as food for themselves and for feeding the fish in floating baskets during the spawning season when it is quite difficult to practice

fisheries. Nevertheless, the villagers, in practice, always use this priority as an opportunity to earn income as well. The regulation of the Hadpana community further has an exception allowing fishers to use small meshed seine nets such as *Khai Pae* (shallow seine nets) to catch fish near the shore; the regulation states that they can place only 5 nets per each person. The fish species caught by these small meshed shallow seine nets are mostly scaled fish species which will not grow to be very big. The fish will be used as bait or cooked as *Pla Ra* (fish preserved with salt). Moreover, many fishers who have a strong conservative conscience will release all kinds of fish so that they can grow bigger. “If we don’t release them, we will not have anymore fish in the future. This kind of fish can grow much bigger; it is not worth it to use them with this size” (Nam, Interview, 17 November 2008).

2. Destructive fishing gear such as poison, electric shock and bombs are prohibited in the Hadpana area; if fishers are found to be using these methods they will be arrested by the fishery patrol immediately. The fish caught by these methods will have specific characteristics that the fish trading raft’s owners can recognize and therefore refuse to buy. Moreover, fishing methods that chase fish from their habitats are not permitted since villagers considered these modes of fisheries to cause potentially negative effects to fish habitats in the long run according to their knowledge. These methods, such as *Tuub*: the method where fisherman place seine nets in the form of a square and then move their boats to the middle and use long, big pieces of lumber or steel to bash the surface of the water scaring the fish and prompting them to move from their habitats into the nets, are considered to be one of the methods that can potentially chase the fish from their habitats for a long duration of time. This method is therefore also prohibited in the Hadpana area, but since it is not illegal, fishers can only warn the users to stop employing these methods due to their undesirable consequences. However, there is no Hadpana villager using this method; only outsiders who come to the area practice this method and they have for the most part been chased out of the area.

3. Just price for fishers. The Hadpana community has an exact price for buying fish that all villagers deem to be just and acceptable. Since the community leader is the one who owns the only fish-trading raft, he has a high influence in the resource management. He sets the price that the fishers can accept and that allows

them to live their lives comfortably from the income gained through fishery. The leader; therefore, is highly respected by the villagers and is not only a leader by position, but also a natural leader as well. Fish prices of the most common fish species in the Hadpana community are explained in detail here:

Table 4.1: Set price for fish sold at Hadpana fish-trading raft

Types of Fish	Price- baht per kilogram
1. *Kang*/ Red-Tailed Mystus (*Hemibagrus wyckioides*)	140
2. *Daeng*/ Sheatfish (*Micronema apogoon*)	140
3. *Kod Luang*/ Yellow Catfish (*Mystusfilamentus*) (more than 600 g)	75
(less than 600 g)	35
4. *Chado*/ Giant Snakehead Fish (*Channa micropeitis*)	25
5. *Chon*/ Striped Snakehead Fish (*Channa striatus*)	25
6. *Bu*/ Sand Goby (*Oxyeleotris marmolata)* (more than 400 g)	380
(less than 400 g)	70
7. *Krai*/ Spotted Knife Fish (*Notopterus chitala*)	55
8. *Satue*/ Feather-Finned Fish (*Notopterus barneensis*)	55
9. *Salard*/ Grey Featherback (*Notopterus notopterus*) (1 kg up)	40
(less than 1 kg)	30
10. *Khae*/ Giant Bagarius (*Bagarius yarrelli*)	150
11. *Krasoob*/ Transverse-bar Barb (*Capoeta macrolepidota*)	10
12. *Nil*/ Nile Tilapia (*Oreochromis niloticus*)	23
13. *Tapian*/ Common Silver Barb (*Puntius gonionotus*)	
(more than 1 kg)	23
14. *Sawai*/ Striped Catfish (*Pangasius sutchi*) (more than 7 kg)	15
(less than 7 kg)	10
15. *Rad*/ Giant Gourami *(Osphronemus goramy*) (more than 400g)	35
(less than 400g)	20
16. *Mor Takrab*/ Striped Tiger Nandid (*Pristolepis fasciatus*)	10

17. *Ka Dam*/ Black Shark (*Labeo chrysophekadion*)		35
18. *Pla Ruam* (Other fish)	less than 1 kg	8
	Removing scale	10

The prices set at the fish-trading raft are quite stable and never vary by the quantity of the catch; thus, the price is very just for all the fishers in Hadpana. Since the fish trading raft is the only one in the Hadpana area, and all fishers have to sell fish there, the community leader uses his influence to support regulations that fishers have to use seine nets with a mesh size over 7 centimeters; if a smaller size is used, the fish trading raft owner will not buy the fish and there will be nowhere else to sell it. Essentially, this act forces fishers to follow regulations and makes the regulations more effective. Normally, each fishing community has its own fish-trading raft, and it is normally known that villagers will trade with their own community's trading raft. This relationship between the fish trading raft's owner, who is normally a community leader and fairly rich person within the community, and the normal villagers stipulates that they must depend on each other in some ways.

4. The catching and selling of *Taparb Marn Lai* (Giant soft-shelled turtle/ *Chitra Chitra*) and *Pla Buek* (Maekong Giant Catfish/ *Pangasianodon Gigas*) is strictly prohibited since they are very rare and must be protected. If they become stuck in the net accidentally, fishers have to release them. The fish-trading raft at Hadpana and *Pak Lam Khakaeng* do not buy these two kinds of aquatic animals. In the case of *Pla Buek*, the Department of Fisheries is responsible for patrolling and arresting those who catch these species. In the Hadpana area, there are many *Pla Buek* living, but villagers normally do not have any intention of catching them since they are too huge in size; moreover, because of its big size, fishers need to use special methods to catch this species and very few fishers are knowledgeable about these methods. Monks living at *Wat Pak Lam Kakhaeng*, who are respected amongst the villagers, also asked villagers not to catch *Pla Buek*. This request made by the monks has had a positive effect on *Pla Buek* conservation. However, there are still fishers catching *Pla Buek* secretly since its size and the amount of meat can bring them a lot of money. These fishers are from outside areas and are specialists in catching *Pla Buek.* If caught, they will take the *Pla Buek* to sell at other provinces such as Ang Thong and Singhaburi, as it cannot be sold in Kanchanaburi due to its illegal status. In

fact, these *Pla Buek* hunters are rarely found around the Hadpana area, as it is quite hard to do illegal fishing within Hadpana; therefore, the situation of the *Pla Buek* in Hadpana is relatively safe.

Figure 4.2: Giant Soft-Shelled Turtle (*Chitra Chitra*)
(Source: http://www.sarakadee.com/feature/endanger_animals/images/giant-softshell-turtle480.jpg)

5. Area limitation. This regulation is set by the Department of Fisheries and the Royal Forest Department in agreement with the Hadpana villagers. The area is determined by the Hadpana Villagers, the Department of Fisheries, and the Royal Forest Department to be communal property that Hadpana villagers must maintain as a model fishing community. The establishment of the exact area is necessary for patrolling the outside borders according to the exclusion policy and effectively controlling fishers in the area to follow the regulations.

These regulations are not established by the Department of Fisheries in the form of top-down commands, as was typically done in the past, but these regulations were created through the ideas of villagers who live in the area and further developed through the co-operation between the Department of Fisheries' officers and villagers to find the most suitable solutions for managing the aquatic animal resources in the area. Moreover, since Hadpana is a newly-settled community, it does not have an established method of aquatic animal resource management based on common traditional knowledge, customs, beliefs, and rituals as in the old-settled communities along the river basins. Communal regulations of old settled communities are drawn from both collective rules based on co-operation and conservation of the community's

members, and regulations based on supernatural beliefs regarding natural resources (Piyaporn 2007: 179). The newly-settled communities such as Hadpana, which do not share the same origin of beliefs, established their regulations based on only co-operation, conservation, and the goal of finding a way for community members to live together under regulations that will guarantee that all members can profit from sustainable aquatic animal resources in the area by following the regulations i.e. the common interests of villagers is the main factor utilized to manage the resources.

Apart from the regulations created to manage the resources, the courtesy amongst fishers (resource users) to one another is also important in resource management. From their experiences, fishers know how to avoid confusion in their fisheries practice and it seems to be an unwritten regulation that fishers need to know and act in ways that promote the use of aquatic animal resources appropriately in conjunction with others. Courtesy towards fishery in Hadpana is mainly focused on the use of aquatic animal resources and rights. Hadpana villagers accept the right to access fishing spots as a courtesy. Fishers who reached such spots first have the right to practice fishery in the area and no one can take over that right. The followers will know that they should put their fishing gear (seine nets and line hooks) at least 40 meters from the others in order to avoid the nets sticking together and create more space for everyone to fish. In the case of *khai Pae* (shallow seine nets), fishers can place them fairly close to others (10-20 meters) since this kind of seine net has to be placed near the shore; therefore, there are not as many spaces for fishers to choose to place them. Most fishers in Hadpana follow this courtesy in order to maintain comfort and avoid confusion in fishery. Even though it seems they must race to get good spots to fish, this attitude in the long run makes their lives easier as does respecting the rights of others to access the resources.

The regulations and courtesy of fishers in Hadpana is the result of an attempt to manage the relationship between human-human and human-environment. The management of these two relationships originated from the participation of Hadpana villagers using their knowledge to create regulations accepted by all community members as a means of establishing their own methods of resource management. The solution and goal is that if villagers feel they have more responsibility than simply

following the regulations created by the authority they will strive to take care of the aquatic animal resources as owners who have a direct responsibility to it.

4.3.2 Conservation and Protection

The section of management toward area limitation is conducted by the Department of Fisheries together with the Royal Forest Department with the agreement of Hadpana villagers. The policy of the Department of Fisheries is to restrict the use of the area within the Hadpana community from those who are not members of the community in order to limit the number of catch. The entrance to the restricted area of the Hadpana community is marked by a sign floating in the middle of the reservoir that states, “Hadpana model fishing community; the establishment of model fishing community project; strict fishing prohibition for outsiders.” This sign further indicates the beginning of the Hadpana community area. The restricted area continues on to a section in the reservoir near *Huay Samuting*; here there is a sign nailed to a dead tree in the middle of the reservoir bearing the words “No fishing in this area.” Hadpana villagers refer to this place as *Ong Thang*, which is also the name of a wildlife checkpoint built in the north of Hadpana. From *Ong Thang* wildlife checkpoint, the area is under the responsibility of the Royal Forest Department’s officers; no fishers are allowed to enter the area due to the fact that over *Ong Thang* there lie several water sources that are spawning grounds for fish. Fishing prohibition in the area is totally reasonable; moreover, the area of *Ong Thang* is inside the western forest complex which has a high level of biodiversity including big animals such as boar, tigers, and elephants; allowing people to enter the national park creates a risk to animals and other forest resources and this is the main reason of the Royal Forest Department to restrict the area. The area over *Ong Thang* is thus prohibited from all people except officers.

The area of the Hadpana community is the most northern place in the Srinakarin Reservoir that can practice fisheries. However, the area of the Hadpana community, from the floating sign to *Ong Thang*, is restricted to outsiders. This is relevant to the concept of the community-based fishery management; the community must determine the exact area to be restricted in order to keep the number of fishers at a level that will not over fish the fishing stock. If Hadpana villagers find that there are

some outsiders practicing fisheries in the area, they will ask them to leave the area immediately. However, there are some people who try to resist stubbornly; Hadpana villagers react by using force i.e. forcing those people out by physical strength, scaring them with rigid expression, being ready to use weapons if necessary, or informing the Department of Fisheries and requesting them to take care of the situation. Luckily, since Hadpana was established as a model fishing community, no violent situations have occurred between Hadpana villagers and outsiders.

Normally, fishers living in the Hadpana community can practice fisheries in all areas within the community as well as outside the community. However, from 16 May to 15 September of every year, the Department of Fisheries announces that spawning season has come, and the Department prohibits all kind of fisheries besides those types utilizing fishing gear that is in allowance (see Appendix I). In the case of the Hadpana area, the Department of Fisheries, who in charge of Srinakarin reservoir (Fishery Patrol of the West), gives the fisherman priority to practice fisheries in the spawning season; the officers and villagers made an agreement that Hadpana villagers are allowed to place five nets per person in order to make a living. Nevertheless, there are not many villagers practicing fisheries during this season; especially not the elder fishers as they are the ones who view this practice as not being worth their physical investment. Typically, only youngsters who are very active in using their quota will place nets during this time. However, the Department and villagers agreed to prohibit practice of fisheries in the area of every *Huay* (stream) that is the spawning grounds for fish. Furthermore, the agreement between the Department of Fisheries and Hadpana villagers also allows villagers to use *Yor* in order to catch tiny fish to feed the fish in floating baskets, because *Yor* is a fishing gear that can catch only tiny fish and cannot be placed in any spawning areas. The compromise between Hadpana villagers and the Department of Fisheries Officers occurred because of the understanding that Hadpana villagers live their lives mainly by practicing fisheries; therefore, the compromise will give them an opportunity to earn their living in a controlled way. This is a special allowance that applies only to Hadpana villagers.

The Department of Fisheries officers also supports raising fish in floating baskets to be released into the reservoir under the aquatic animal rehabilitation project portion of the model project. However, at this time only the community leader is

raising fish to release, while the other families are raising fish to sell. From the interview with Mr. Nit Parnkurd, fishing expert and community's committee member, villagers of Hadpana plan to expand the aquatic animal rehabilitation project from one location to three locations in front of the streams (*Huay*) by placing 2-3 floating baskets in each location beginning from the committees' rafts. Hadpana villagers further take actions causing these streams to fall under the category of restricted areas for all kinds of fishing methods as a means of conserving fish. Again, villagers, with the support of the Department of Fisheries, will release rare species of fish like seven-striped barb (*Probabus jullieni*) into the reservoir to increase the numbers of this rare fish according to the recommendation of villagers themselves to choose the fish species to be released into the water (Nit, Interview, 28 May 2009).

According to the document referencing the establishment of a model fishing community project, raising fish in floating baskets has the potential to attract natural fish around the area to the vicinity of the floating baskets as they provide more safety than other places. Furthermore, fishing near the floating baskets is not a good practice for fishers as the floating baskets are placed in front of their rafts and villagers have to move their boats in and out frequently. Tying seine nets or lined hooks in this area is therefore not a practical practice. At present, many villagers do not completely understand the effects of the floating baskets, but they do not doubt their benefit in principle since at least they will be guaranteed to raise fish to release and they also can recommend the fish species to be release as well.

Destructive fisheries methods such as poisoning, electric shock, and bombing are no longer practiced in the Hadpana community area at this time. The strict enforcement of regulations by officers and villagers is an important key factor to maintaining the village's success.

4.4 Stakeholders

Apart from the villagers of Hadpana community, there are also many stakeholders involving with the resource management, which are:

1. The Department of Fisheries Officers

The Department of Fisheries has an important role in the Hadpana community's resource management. It can be said that the success of the Hadpana

community's management will never occur without the assistance of the Department of Fisheries. Beginning from the establishment of the project, the Department of Fisheries set in place a policy regarding participatory aquatic animal resource management in order to solve the fishery problem in Thailand and expand the establishment of model fishing communities to be an important project of the Department. The distinct policy and the determination of the Department of Fisheries' officers responsible in the Hadpana community assisted the village in becoming a well-construct model fishing community considered to be one of the most successful model fishing communities in the project (Anonymous fishery patrol of the west's officer, Interview 28 August 2009).

The relationship between officers and villagers is very positive and they get along and work well together without problems. Each side feels free to concentrate on their own roles and trust each other to do the same. The aquatic animal resource management in Hadpana therefore operates in a comfortable and effective way. Villagers also stated that the current set of officers is a group of good persons who intentionally attempt to develop successful fishing communities; therefore, they will not be transferred as previous officers since the results of their duties are satisfying (Hadpana villagers, Interview, 25 November 2008 and 28 May 2009). The establishment of a model fishing community in Hadpana also creates profit for these officers in the form of results of their work as well. However, the officers of the Department of Fisheries, as state officers, have to be facilitators and servicemen in order to allow the villagers to manage the resources by themselves. The way officers in the Hadpana area work does not interfere with the villagers' participation; this is very important in participatory aquatic animal resource management. The Department of Fisheries; thus, is the most important stakeholder in participatory aquatic animal resource management of Hadpana since its officers are specialists who can assist and consult with villagers in times of need.

With the awareness that the success of the resource management of Hadpana is dependent on individuals i.e. the current set of officers in charge, the Hadpana villagers believe that it is impossible to transfer all the officers who have done a good job in the area to other areas. At least the head office must have some role and

continue working on the project in order for the effectiveness of the area to continue. The villagers' opinions are quite optimistic, but they are also reasonable.

2. The Royal Forest Department Officers

The other state unit involved indirectly with aquatic animal resource management, but also focusing on the livelihood of the Hadpana villagers, is the Royal Forest Department. This department takes care of the use of forest products used for repairing rafts and forest product gathering. Some corrupted officers can benefit from allowing villagers to gather forest products and asking for some portion of the products that villagers have gathered in return. The relationship between the officers of the Royal Forest Department and Hadpana villagers is quite negative because villagers feel that the officers frequently take advantage of them. Moreover, the officers at *Ong Thang* wildlife checkpoint have an additional important role in prohibiting any people from passing through the restricted area. The officers also hold the license to shoot anybody crossing the line. Nonetheless, some villagers in both Hadpana community and the outside try to bribe park rangers of *Ong Thang* to allow them to practice fishery inside the restricted area. Sometimes, they can catch many fish worth more than 2,000-3,000 baht in one night, but sometimes they are arrested or shot by the park rangers who accepted the offer from them. Though not many villagers bribe park rangers to fish in restricted areas, this is a serious problem that could potentially harm the resource management of the Hadpana community in the future.

3. Sub-District Administrative Organization (SAO)

Sub-district Administrative Organization does not directly take part in resource management, and the organization does not have any budget for the establishment of a model fishing community project. The organization focuses on the forest product gathering (Nam, Phe, Nit, Interview, 28 November 2008 and 17 March 2009) by order of Srinakarin National Park, and it is rarely concerned about fishery in the area.

In the near future, *Khaojot* SAO aims at cooperating more with the community toward the aquatic animal resource management through supporting budgets to buy fish to be released into the natural waters and dealing with external powers. The organization is useful for the extension of community organizations intending to

increase the power of the community and negotiate with external authorities that are the influential persons from outside the community, Royal Thai Forest Rangers, EGAT Officers, and the role of SAO will be very important in the future development of the Hadpana community and it is quite certain that with the participation of SAO, some potential problems involving the external powers will be reduced if SAO can work seriously and effectively.

4. Private Company

A private stakeholder also tried to become involved with the project. An animal food company attempted to propose its products to the community by distributing fish food for free; however, the food was not seen as a good aquatic animal resource management tool in the villagers' perspective; the company therefore lost interest in the Hadpana community. Hadpana villagers also negated the fish species (*Pla Tabtim*)[19] that the company wanted them to breed in the baskets since they considered the fish appropriate for raising in the area and not worth the cost compared with the species they typically raise.

Hadpana villagers came to the conclusion on their own that the fish food and fish species suggested would not work well in their area. Therefore, they went back to raising their previously chosen fish species that are more appropriate to the area. This situation also represented that villagers believe in their community knowledge and do not accept suggestions without thoughtful consideration.

The only stakeholder who is directly involved with the resource management of the Hadpana community is therefore the Department of Fisheries who has a strong responsibility in their duty to help maintain the area. While the other stakeholders, the Royal Forest Department rangers, who have only one responsibility related to the aquatic animal resource management that is the guarding of *Ong Thang*, are viewed as the weak point that could potentially harm Hadpana's management. SAO is just about to begin to participate in the resource management and has no responsibility in practice at this time. The private companies failed in their plan regarding Hadpana have not shown further interest in the area.

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19 A fish species crossbred from Nile Tilapia to have softer meat; now one of the most important economic fish in Thailand.

4.5 Obstacles of Hadpana's Aquatic Animal Resource Management

Obstacles of Hadpana's management are mostly from the outsiders, external authorities and other stakeholders. Moreover, few villagers also posted an obstacle to the resource management. Some obstacles just recently occurred and some have been persistent for a long time.

4.5.1 The Invasion of Outsiders

One of the obstacles that could potentially harm Hadpana's resource management is the invasion of outsiders. As a model fishing community that uses community-based fishery management, Hadpana community needs to determine the exact area that is under the management of the community. The exclusion of outsiders to practice fisheries in the area is used to control the area according to the model fishing community's principles; however, there are still some people trying to escape Hadpana villagers' vision in order to fish inside the area since it is more abundant than outside areas. However, trespassing in the area of Hadpana to obtain fish resources is quite a difficult practice because of physical features of the areas and the fact that there is only one entrance by water. The outsiders who sneak in to fish in Hadpana have to use quite complex methods to do so.

Since Kanchanaburi is famous for its forests and aquatic animal resources, many people wish to do business in this province. In the case of the Srinakarin Reservoir, many rich, influential people became investors in the tourist industry and animal businesses e.g. fish-trading rafts and animal husbandry. Though its location is in the very far north of the reservoir, Hadpana area cannot escape from the encroaching businesses that can have negative effects on the community. The tourist business is a strong threat to the Hadpana community. Tour groups are allowed to enter the Hadpana area only by boats and floating rafts. Normally, tourists come to Hadpana for sport fishing and relaxing; however, many times a hidden menace can come with the tourists. Groups of professional fishers with modern equipment i.e. spear guns and oxygen tanks come to Hadpana to catch very huge and expensive fish species such as Red-Tailed Mystus (*Hemibagrus wyckioides*), Giant Gourami *(Osphronemus goramy*), Nile Tilapia (*Oreochromis niloticus*), Sheatfish (*Micronema*

apogoon), and Giant Snakehead Fish (*Channa micropeitis*) in large numbers and take them out of the community by hiding them under their rafts. This method of catching fish is quite difficult to arrest since the catchers can dive in the water and stay under water for long periods of time oxygen tanks; moreover, these people will fish during the night when it is easy for them to hide from the villagers. Some groups of tourists also hunt reserved animals such as *Krathing* (Gaur) and *Wua Dang* (Banteng) in the area of the national park. Villagers stated that these kinds of people are typically influential people. Due to the complaints from villagers, Department of Fisheries' officers and park rangers of the Srinakarin National Park prohibited tourist rafts from passing the floating checkpoint close to *Wat Pak Lam Kha Kaeng* and entering the Hadpana area, but the prohibition was only enforced for one year before the tourist rafts were allowed to enter the Hadpana area again. In 2009, the allowance of tourist rafts to enter Hadpana is still questionable since the rangers at the checkpoint temporarily prohibit the area. No one really knows about this allowance (Waipot 25 August 2009).

The Hadpana community led by the community's leader, Mr. Waipot Nangnoi, tried to solve the problem of the tourist rafts by managing the floating rafts and home stays of the Hadpana community for tourism so that they could control and watch over them more easily; however, this proved ineffective as there is no road to enter Hadpana directly; therefore, tourists had to find boats or rafts to continue their trip themselves. Thus, tourists usually hire rafts or boats from piers close to the main road so that they can arrive comfortably. This is still an unresolved issue and a problem for the Hadpana community and will remain so until the Royal Forest Department prohibits tourist rafts to enter the Hadpana area.

Offering bribes to the park rangers is another common way of practicing illegal fishing in the Hadpana area. However, fishers who pay bribes are still forced to head north over the *Ong Thang* check point to fish as Hadpana villagers have no rights or power over that area. Hadpana villagers are well aware of the corruption of the rangers, but they do not want to get involved with their actions. This is a prominent problem as it leads to the destruction of fish living directly in the water source and is beyond the responsibility of the villagers.

Some EGAT officers are also important invaders as they lived previously in the upper northern area of the reservoir over *Ong Tang*. At times, they abused their responsibilities in the restricted areas and practiced fisheries in the water sources by utilizing destructive fishing methods such as electric shock and bombing. Villagers of Hadpana stated that some EGAT officers have practiced fisheries at the water sources for many years. Furthermore, news reporters and authorities of Kanchanaburi found physical evidence supporting these claims around 2-3 years ago. Nowadays, the EGAT officers still go to the restricted areas occasionally, but not as frequently (Hadpana villager, Interview 25 August 2009).

Remarkably, the invasion of the outsiders usually occurs over the *Ong Tang* checkpoint, the real water source of the Srinakarin Reservoir. This problem is crucial because the corruption and weakness of officers responsible for the area allows for invaders to enter the restricted area. The Department of Fisheries and the Royal Forest Department need to co-operate in order to solve this problem due to the fact that the invaders typically have connections with these two departments and refer to that connection as an influence allowing them to break the laws and regulations.

4.5.2 The Deviance of the Insiders

Most of the Hadpana villagers follow the regulations and principles of the community-based fishery management and resource conservation since they believe that following them will create more profit for them in the long run. However, some fishers in the community (about 3-4 persons) still take chances and disobey the social control by using fishing gear in ways that is against the community's regulations and courtesy, i.e. placing line-hooks that obstruct the area from the use of others, placing their gear and seine nets too close to previous ones potentially causing the seine nets to bind together, using seine nets with smaller mesh sizes than regulations allow for, or using more than 5 nets during the spawning season. These behaviors occur quite often. This kind of fishers takes chances to gain more profit by breaking the regulations because they do not have a strong realization of the importance of the community-based fishery resource management and resource conservation at a deep level. They follow the regulations only for the purpose of avoiding the negative social

sanctions that could be brought upon them in both formal and in formal ways (Hadpana villagers, Interview, 17August: 2008).

An interesting point is that most of the villagers who willingly follow the norms in resource management of the Hadpana community are those who have suffered first hand from destructive and over-fishing in the past; hence, they know the consequences and want to conserve the resources to better their lives in the future. Their attitudes towards resource conservation are positive and they strictly follow the regulations without any reluctance. This group of fisherman tries to warn those few persons against acting in deviant ways, but the results can be negative as it can lead to conflicts between the two groups. Luckily, this kind of situation typically ends with discussion, and because of the strong relationship amongst villagers, they usually remain in the standing of good neighbors who are always ready to lend a hand to one another. Nevertheless, if practice of these deviant behaviors was realized by the fisheries patrols, fishers would suffer greatly, i.e. if the patrols find any seine nets placed in the prohibited areas they will cut the nets and dispose of them on land. Similarly, villagers are well aware of the behaviors of each other, and they will inform the community's leader if they see any behaviors against the community's regulations being practiced. Those fishers will then have problems selling their fish to the trading raft and operating fisheries in the future.

This problem is not as crucial as the first one, but it is an important obstacle that could grow larger in the future by thriving on the weak point of the aquatic animal resource management of a newly-settled community that is not rooted in common traditional knowledge, customs, rites, beliefs, and a collective conscience. Some villagers commented that those fishers do not have a very deep sense of community; therefore, they choose to earn for themselves rather than maintaining the resources for the common benefits.

4.5.3 The Misunderstanding of the Other Communities

In the Department of Fisheries' opinion, the establishment of a model fishing community is one of the most effective ways for solving aquatic animal resource management problems as it gives opportunity to local villagers to participate in the resource management. Due to this principle, the exclusion of the fishers living outside

the community is necessary to limit the number of fish being caught. However, the principles of the community-based fishery management are still new for local fishing communities and have caused some misunderstandings amongst communities who are not under the establishment of a model fishing community project.

There are two main fish-trading rafts in the north of the Srinkarin reservoir. There is the one that belongs to Mr. Waipot, the leader of the Hadpana community, which is situated inside the Hadpana model fishing community's area, and there is another one owned by Mrs. Art (assumed name) situated at *Pak Lam* not far from *Wat Pak Lam Khakaeng* (See Figure 3.1). As mentioned above, the relationship between villagers and the fish-trading raft's owner, who is normally the local influential man of the community, causes fishers to sell fish only to the fish-trading raft in their area. Problems can arise; however, because villagers at *Pak Lam* do not understand the reasoning behind these actions and feel that the model fishing community is excluding the outsiders. They see this exclusion as a limitation of their rights to fish in the north area of the reservoir. They also consider it to be unjust that they cannot operate any fisheries in the Hadpana area; only fishers of the Hadpana community can practice fisheries in their area.

The fishers at *Pak Lam*; therefore, acted against these unjust (in their understanding) actions by obstructing the fisheries of the Hadpana fishers. The obstruction was carried out by cutting the seine nets or line hooks if they saw Hadpana fishers putting these types of gear in their zones. In the most extreme cases, they sometimes sank the boats of the Hadpana fishers. Fishers affected by these acts know who is responsible, but with no evidence they can do nothing. In the worst-case scenarios, these situations ended with deaths or injuries due to the problems being solved with guns or weapons. These actions seemed to deter Hadpana fishers from operating fisheries in the *Pak Lam* zone indirectly (Nit, Nam, Phae, Tone, Interview, 25 November 2008).

The relationship between these two communities is in a very poor condition currently. It was stated in the interviews with the Hadpana villagers that most feel they have good personal relationships with only some people from *Pak Lam*. Drawing from the interviews with villagers living in the *Pak Lam* zone, they look at the Hadpana community as a privileged community who has many rights and more

authority than others; they feel that the Hadpana community is corrupted since Hadpana villagers use their authority to take advantage over the resources themselves by using illegal methods such as the use of destructive fishing methods and small-meshed seine nets. However, from the investigation of the researcher, the Hadpana villagers do not currently practice such fishing, but they have admitted to committing such actions in the past. At present they have quit using these practices but outsiders believe that they are still using them.

The poor relationship between these two communities could be a prominent obstacle for the development of the participatory aquatic animal resource management in the future. This is because the next step of the community-based fishery management is to build the co-operation between communities. *Pak Lam* was once considered by the Department of Fisheries to be established as a model fishing community, but the department finally denied them since the physical features of the community caused them to be disqualified. However, in the future the Department plans to expand the establishment of the model fishing community and villagers at *Pak Lam* stated that their community would be included in the project in the future like the *Plai Nasuan* community. In summary, villagers of Hadpana and *Pak Lam* have had conflicts with each other for a long period of time and at this time still have misunderstandings and negative attitudes towards each other that might affect the co-management of aquatic animal resources in the future.

4.5.4 The Corruption of the State Units

At this time, the stakeholders involved with the Hadpana community are only the Department of Fisheries officers (the fisheries patrols, scholars) and the Srinakarin National park rangers; both are state units and private stakeholders are not involved with the Hadpana community anymore. Villagers emphasized that the current group of Department of Fisheries' officers works very diligently and concentrates on improving the project without any corruptive behaviors like the previous officers[20].

[20] The corruptive acts of the rangers are done by using unjust authority i.e. they do not give rights to villagers to cut bamboo to fix their rafts. If they allow them to cut the bamboo they force them to cut twice as much as needed in order to give half of the product as a bribe to the rangers. Moreover, taking bribes from villagers and influential people in turn for allowing them to hunt, gather forest products, or operate fisheries in the restricted areas also occurs.

The most problematic unit is the rangers of the national park; especially, the ones guarding *Ong Thang* wildlife checkpoint. These rangers accept bribes from the villagers of many communities (unfortunately, some of the Hadpana villagers also pay) in exchange for allowing them to enter the *Ong Thang* area and reach the water source in the upper north where the fish are numerous. This act is a very crucial obstacle for the effective management of the aquatic animal resources since the fish are caught outside the authority of the Hadpana community and these actions create a very large loss of fish since the water source itself is abused. Requests made to superiors seem to do nothing for the villagers; the best way is for them to discharge those rangers and recruit new ones. Regardless, the rangers allowing fishers to enter the water sources in the restricted areas must be brought to attention and dealt with effectively. Moreover, this obstacle represents one important fact that even though villagers have community rights, they still do not have the authority to deal with the responsible state officers that negatively affect their community in indirect ways.

Moreover, some external authorities like EGAT officers, and other state officers sometimes use their influence to practice fisheries over the water source as well. *Ong Thang* becomes a very problematic place for the Hadpana aquatic animal resource management. The situation at *Ong Thang* represents power being exercising as a means of taking advantage of the resources by the external authorities and influential people, and the corruption of the state officers responsible for the area. The complex relations of power amongst the people involved causes the problem of *Ong Thang* to be the one that still persists at this time and could potentially harm the management of the Hadpana community in the future as well. To solve this problem, SAO must seriously negotiate with state officers and influential people to find the best solution for the management of the water source over *Ong Thang* allowing for the existence of future sustainable fisheries in the Srinakarin Reservoir.

4.6 Conclusion

The participatory aquatic animal resource management of the Hadpana community began as an attempt by the villagers to stop using destructive modes of fishing and was developed through time by the participation of the Department of

Fisheries. The Department of Fisheries realized that in order to solve the fishery crisis they must depend on the participation of local villagers in managing the resources as the owners of their own area. The establishment of a model fishing community project; therefore, was set up to re-organize the fishing communities in a way that they could manage the aquatic animal resources by themselves while the state units changed their roles to be only facilitators. The process of developing Hadpana into a model fishing community progressed in these ways according to the community-based fishery management principle that local villagers play the most important role in their resource management.

Through the co-operation with stakeholders, Hadpana organized a way of resource management by participating and proposing the methods to manage all aspects by community members with the additional advice from the experts of the Department of Fisheries. Regulations and courtesy regarding fisheries constructed by the users are surely more trustable and effective than the ones created by the authority who is the outsider. The participatory aquatic animal resource management relied on the change of the resource's status. The change of the status of aquatic animal resource in the area from public property, which is open access for everyone, to the communal property, which is available only to the owner who maintains and takes care of the resources, is necessary for sustainable fishery as it limits the number of catch units in order to avoid over-fishing in the area. The management of Hadpana can control this exclusion quite effectively since the community is established as a model fishing community and holds legal power to take action against people breaking the regulations. The transformation of the resource's status also changed the status of fishers from that of users to one of owners. The fishers not only use, but are also forced to conserve, their resources. These regulations were created in order to control the use in ways that sustainable fishery should be practiced. The co-operation of the villagers in following the regulations strictly caused the management to be deemed so effective that the Department of Fisheries rated the establishment project of Hadpana to be successful in the way of the participatory aquatic animal resource management (Waipot, Interview, 28 May 2009).

Though villagers do not share a common ground of beliefs constructing a traditional knowledge base regarding resource management as in old-settled

communities, they use the established regulations and courtesy as a common ground for living together. The villagers realize that the aquatic animal resource management of Hadpana is not based on a supernatural power that causes a collective conscience through traditional beliefs, but is rather based on the collective benefit they gain through the co-operation with the community's management. Villagers of Hadpana know that the way they choose to manage the resources can provide them with more advantages and profit. The villagers are very satisfied with their current status as a model fishing community; thus, they will follow the regulations as strictly as possible in order to guarantee that they can maintain their present status and manage their resources effectively.

CHAPTER V

THE ANALYSIS OF FACTORS CONTRIBUTION TO SUCCESSFUL RESOURCE MANAGEMENT

The approach towards aquatic animal resource management in Thailand has changed from top-down management by authority figures to participatory aquatic animal resource management where the most important role is assigned to the local villagers living within the resource area. For many years, the old-settled fishing communities have established and practiced their own methods of participatory resource management. Drawing upon common traditional beliefs as the basis of the management principles, and further utilizing the re-production of the meanings of these traditional beliefs in order to adapt them to be used in the present, these old-settled communities have formed an established a clear identity as a 'community' in the context of power relations. This identity serves to re-adjust the state-community relationship towards the resource management to one of a community form of management. The existence of this community further served as a discourse requiring rights over the resources within the community's area during the period of struggle when outsiders and authorities tried to take advantage of the resources in the local communities' areas.

Community rights are widely discussed at both a discursive and practical level resulting in the decision that the rights over the community's resources must allow the community to participate, access, and share the resources fairly and in a sustainable way amongst the communities' members. Together with the failure of top-down resource management by the authorities, the decrease of resources within the communities was severe, further promoting many movements against the old paradigm and towards the new community based resource management. The consideration of the importance of the local community's role in resource management and local community rights to manage the resources emerged. Hence, community rights brought to light within the social space the fact that local communities have the power to alternatively re-manage resources within the

community itself in a way that is more effective than the previous practices organized by the state authorities.

The aquatic animal resource management based on common traditional knowledge is the identity of the old-settled fishing communities represented through the relationship management between humans and nature. However, the traditional knowledge must be dynamic and adaptive in order to be suitable to withstand social change. Community rights are not a static concept, the concept of the community rights must be adjustable according to the situations at hand in order to affirm that local communities have the potential to adjust and deal with external powers and change effectively. The old-settled fishing community's aquatic animal resource management practices have been studied in Thailand for many years. The cultural dimensions based on traditional knowledge, customs, rites, and beliefs transmitted over time is considered to be an important mechanism that when combined with the knowledge of utility has lead to the construction of an effective means of aquatic animal resource management within the old-settled fishing communities. Since the community's members share a common ground of cultural dimension, their collective conscience is deeper than that of the common benefit gained by the co-operation of members towards the resource management. Although re-production of resource management discourse emerged in order to deal with social change, the traditional knowledge, beliefs, customs, and rites are still the most important mechanism utilized in order to re-produce the aquatic animal resource management practices of the old-settled fishing communities. Most fishing communities along main rivers such as the Salween, Ing, Yom, Songkram, and Mekong Rivers have been settled in the area for over 50 years, and most of the members share common cultural roots. The religious, spiritual, and supernatural beliefs, which are intrinsic with the daily lives of the community's members, expanded to the scope of including aquatic animal resource management as an aspect of the community's identity managed under these grounds of thinking. Undeniably, the success of old-settled fishing communities sharing the same traditional roots is highly dependent upon the existence of a traditional form of knowledge, beliefs, customs, and rites.

Hadpana community, unlike the communities along the main rivers, was settled less than 30 years after the Srinakarin Dam construction. This meant that

people living in Hadpana were forced to move from outlying areas within the settlement to a central gathering area of fishers in order to live elsewhere outside the restricted areas under the command of the Royal Forest Department. The Royal Forest Department requested that those living in the restricted area in the north of the Srinakarin Dam National Park over *Ong Thang* resettle to the area outside the national park and wildlife sanctuary's area. Many villagers moved southward to an area known as Hadpana where they are living at present. This move leads to many people possessing various ethnicities and cultural roots living together as fisherman in the Hadpana area. As mentioned previously, the aquatic animal resources in the area had decreased drastically due to destructive and over-fishing around the area. A small group of fishers living in the Hadpana area tried to re-manage the resources in a participatory way, but with no power, their management attempt was not very effective. Until the Department of Fisheries registered the community to be a part of the project aimed at establishing a model fishing community, the community developed itself in order to manage aquatic animal resources in a way of community-based fishery management so effectively that the stakeholders and authorities of Kanchaburi[21] were prompted to visit the community and survey the development of the establishment of the model fishing community project. Hadpana was examined by the officers of the Department of Fisheries and it was seen that the community's participatory aquatic animal resource management was effective and prompted positive effects. Though Hadpana does not have any knowledge system constructed under a common traditional knowledge, the community constructed and developed their own mechanisms and methods to manage aquatic animal resources effectively and in a different way unique from that of the old-settled fishing communities.

[21] Mr. Chaiwat Limpwantana, the vice governor, Mr. Somboon PanBrahma, the member of provincial council of Si Sawat district, Mr. Songjam Kruengsai, the chief of fishery executive management, Si Sawat district chief officer, Kanchaburi co-operative, Kanchanaburi livestock development officers, Kanchaburi agriculture officers, Department of Fisheries' officers, and the chief of the western fisheries patrol visited Hadpana community at 14 May 2008 to survey the progress of the establishment of a model fishing community project (Suksan 2008).

5.1 The Mechanisms of Hadpana Management

The grounds for success in Hadpana's aquatic animal resource management depend on established mechanisms to assist the management to run comfortably. The mechanisms of Hadpana's management are not based on cultural roots as in old-settled communities, but they are developed through both internal and external mechanisms: the internal mechanisms are the process of social control, the strong leadership of the community's leader and the construction of organizations based on the common interests of villagers; the external mechanism is the mutual co-operation with the Department of Fisheries officers. The mechanisms of Hadpana community are not adhered to only one unit (neither state nor local community), but they are constructed through the context of the co-management between state units and the local community itself as in the figure 5.1

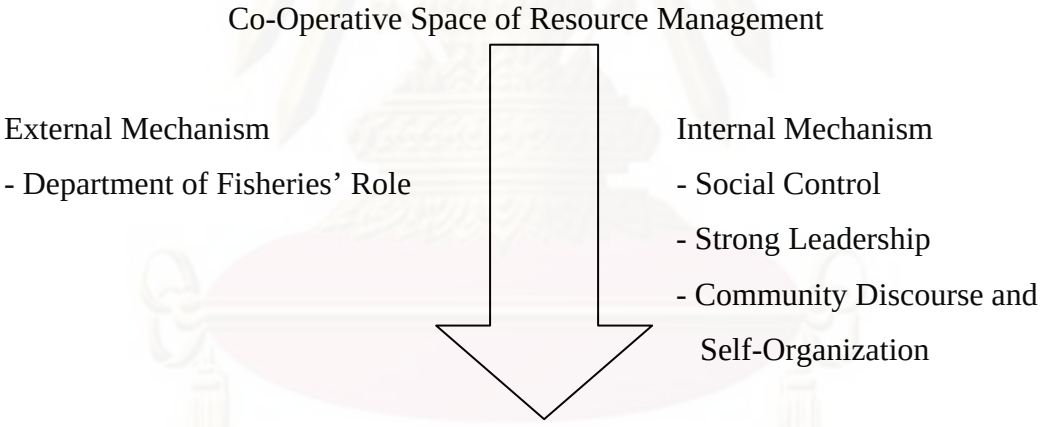

Figure 5.1: Conceptual Framework

5.1.1 Internal Mechanisms

1. Social Control of Hadpana

The resource management is a means of managing the relationship between humans and nature; some norms in resource management have been constructed in order to determine the scope of using and maintaining natural resources. In the case of Hadpana, the participatory aquatic animal resource management policy gave the

community the opportunity to participate in the management's determination. Therefore, villagers themselves created all regulations, while officers from the Department of Fisheries became only facilitators.

The local fishing community is settled around, and exists in tandem with the aquatic animal resources in the area; in other words, the existence of the aquatic animal resources allows for the existence of the local fishing community. The concept of the participatory aquatic animal resource management is based on the rights over property as its core. Since Hadpana, as a model fishing community, excluded outsiders as a means of limiting the number of fishers, the access rights and withdrawal rights belong only to Hadpana villagers. The access and withdrawal rights are affirmed by the Thai state through the Department of Fisheries under the regulation that only villagers living in the Hadpana area can use the resources as their communal property. The resources in the Hadpana area have therefore been transformed from public property, which allows for free access to communal property, that only members of the community having responsibility over the resource management have rights to use legally. As a model fishing community, the Department of Fisheries affirmed the rights of the community to participate in the resource management; therefore, the community has rights to determine norms of resource management for all members. According to the establishment of a model fishing community project, people holding the right to catch fish within the area of the model fishing community must be the community's members who follow the regulations of the community. Hence, the regulations created by the villagers became the basis for managing the aquatic animal resources in Hadpana.

For the old-settled fishing communities, regulations or norms of aquatic animal resource management are closely related to common traditional beliefs and knowledge systems constructed and transmitted over time. Theoretically, social control is a mechanism built by a society to force its members to follow the norms. Social control of old-settled fishing communities is formed under traditional grounds related to spiritual and supernatural beliefs and consideration for sustainable fishery.

Owing to sociological concept, social control has two basic forms (Jary and Jary 1991):

1. Internalization of norms and values

2. The use of sanctions, which can be either positive (rewards) and negative (punishment)

Norms towards aquatic animal resource management of a newly settled fishing community which does not have traditional roots are based on community knowledge from villagers' experiences mixed with the fishery knowledge of the Department of Fisheries. Norms in resource management of Hadpana villagers are not very different from the Thai state's fishery regulations enforced in natural freshwaters due to the fact that the knowledge that is the principle of regulations is based on both the villagers' own experiences and fishery research.

Norms in resource management that are deeply rooted into a community are easily accepted and followed by community's members because they are consciously established in the villager's beliefs already. However, the norms in resource management that do not have cultural roots transmitted over time require some other methods to be initially constructed. In order to prompt people to follow the norms of a society, social control is necessary.

Socialization is a process of social control aimed at establishing a social order; Hadpana community established regulations in order to manage the relationships between humans and nature, and humans and other humans within the community. These thoughts, which are the grounds of the regulations and norms of the Hadpana community, are used to socialize its members. The concept of sustainable fishery e.g. using appropriate fishing gear, releasing unwanted fish, increasing stock numbers within the area, the concept of community rights, and the goal of aquatic animal resource conservation are adapted to the principles of participatory aquatic animal resource management of the Hadpana fishing community. All of the Hadpana villagers were instructed of such knowledge by both experts and scholars from the Department of Fisheries and their local fishing experts in order to create a correspondent understanding between the villagers and the officers during the initial stage of establishing participatory aquatic animal resource management in the fishing community. The construction of this principle understanding led to the creation of regulations to control the management of resources.

The past experiences of fishers who used destructive fishing gear to destroy many of the fish and their habitats and over-fish in the area of the Srinakarin reservoir

provided them with concrete evidence of the negative effects caused by those activities that undoubtedly make it difficult for them to live their lives as fishers. Hence, these activities were deemed unacceptable by both state officers (formal) and villagers (informal). The negative social sanctions enforced by the law to control these unacceptable acts unintentionally constructed fear and awareness amongst the villagers.

The awareness of negative consequences caused by over-fishing and destructive fishing is an important factor in the construction of the villagers' conscience. Villagers who have been living in the Hadpana community for over 20 years have affirmed that those activities did create profit, but only once or twice, later causing bad fishing conditions for many years. Many villagers of Hadpana once practiced destructive methods and over-fished for many years, they therefore experienced the negative effects first hand and their incomes decreased by approximately 8 to 10 times over the course of 2 years. Subsequently, they decided to prohibit theses acts and the establishment of the model fishing community project was pursued in the area.

The sense of belonging of villagers in the area is also another factor leading to the construction of conscience amongst the villagers. From the interview with many villagers, they stated that they love this place and want to continue living here since living in Hadpana is very peaceful and comfortable. The villagers' lives are not difficult since they at least have their source of livelihood in the area. Therefore, many of the Hadpana villagers have a very high sense of belonging as the resource owner in the area which creates a grounds of conscience leading to the acceptance of norms in resource management i.e. the villagers understand that following the norms only creates profit to their beloved community.

Apart from the awareness which constructed conscience amongst villagers, there is also fear of negative social sanctions originating from the law enforcement (which is related to the external mechanism and will be discussed later); therefore, the villagers of Hadpana will socialize community members through both their past experiences, community knowledge, the principles of sustainable fishery, the concept of participatory aquatic animal resource management and negative sanctions of being deviant. Being punished (fines, seizure of boats) is not worth the risk to break the

regulations and villagers know that well. The fear of the negative sanctions from the past, that are still effective in the present, has a strong influence on Hadpana villagers.

Social control by regulation is the consequence of the participation of villagers themselves to create rules and follow practices that they all accept. All regulations are considered, chosen, and determined through community knowledge of villagers e.g. choosing the size of the net or prohibiting some kinds of fishery methods. Studies based on the attitudes of small-scaled fishing communities chosen to be regulated under participatory aquatic animal resource management by the Southeast Asian Fisheries Development Center with the Department of Fisheries Management and the Faculty of Fisheries of Kasetsart University found that fishers who face a lack of fishery resources and live their lives only by operating fisheries will have a positive attitude towards participatory aquatic animal resource management (Kangwan 1998: 70) that gives rights to villagers to manage resources in their own way. This fact is concordant with the work of Lertchai Sirichai (2002) which found that the property system established, used, controlled, and enforced by the users of resources will be more effective and sustainable than the one determined by external authority (Banchong 2002: 162). The results and findings of these two researches can be well adapted to the Hadpana community since the properties of the community are quite similar to the researches' conclusions. Based on interviews, the Hadpana villagers have positive attitudes towards the community-based fishery management and know that they are the only community living close to the water sources that are spawning grounds and habitats for fish; instruction by the officers also emphasized that they therefore have more responsibility to maintain those resources than those living further south from the spawning grounds. The water sources must be conserved and used carefully otherwise the lack of resources will spread and widely affect the entire Srinakarin Reservoir. The idea of holding a higher responsibility is also socialized within the Hadpana community; however, the principles and facts toward sustainable fisheries and resource conservation do not hold a stronger influence than the awareness of negative consequences and the fear of negative sanctions.

Moreover, Hadpana community is able to enforce its regulations very strictly. The exclusion of outsiders in order to limit the number of fishers in the area is an important principle of the model fishing community. The Hadpana area has a strong

advantage over most communities in the Srinakarin reservoir who do not have a similar potential to space. The main feature of the Hadpana area is the area that has only one entrance by water; therefore, anyone who wants to enter Hadpana area must pass through the clear sight of the villagers. Other areas in the reservoir have multiple entrances, making it easy for outsiders to operate fisheries in the restricted areas. Furthermore, villagers who have power as the owners of the area, have the right to take anyone fishing in the area to the police and fishery patrol officers for investigation and can investigate suspicious acts in the area themselves. Normally, Hadpana villagers will first use words to warn outsiders trying to fish in the Hadpana area, but in the case that the outsiders are not deterred from fishing in the area, they will be arrested and sent to the officers. The community leaders and respected villagers stated that they try to firstly solve this kind of problem peacefully; however, in the case of destructive fishing they might be forced to use power (legal power and occasionally weapons) to deal with the problem. Luckily, to this day, every conflict has ended peacefully and without problems. The outsiders seem to have accepted the status of Hadpana, which excludes outsiders from its resources under the regulations, and policies of the Department of Fisheries (Waipot, Phra, Nit, Iam, Interview 25 November 2008).

The regulations regarding the size of the seine net's mesh, fish size, and fish species are controlled easily by the trading raft and community leader as all villagers sell their products to him directly. This seems to be an example of internal pressure being used to enforce the regulations strictly; however, it is not compulsory for villagers to sell their fish at his trading raft, but if they want to they have to practice their fishery under Hadpana's regulations (the role of the community's leader and the relationship between the leader and villagers will be considered in the next mechanism in order to clarify the role of the trading raft and the leader as an important mechanism supporting the community's regulations). The owner of the trading raft will further not buy Mekong Giant Catfish *(Pangasianodon Gigas)* and Giant Soft-Shelled Turtle *(Chitra Chitra)* under the Department of Fisheries' policy and community regulations. Moreover, the rules that the trading raft created regarding mixed fish (*Pla Ruam*) is another factor aimed at assisting resource conservation; the price paid for these small fish is very low (8-10 Bath per kilogram) and not worth the

expenditure for the catch. Therefore, most fishers of Hadpana choose to release the juveniles of large species fish into the reservoir allowing them to grow larger. If they keep the small-sized fish they are used only to sell as *Pla Ruam* or to feed the fish in the floating baskets. The grounds of thinking behind this act are not only based on the worth of the investment, but are also based on the idea of resource conservation and sustainable fisheries to not catch unacceptably-sized fish in order to promote breeding in the future. Therefore, interviews showed that many fishers in the Hadpana community willingly release small fish in order to allow them to grow larger (Hadpana fishers, Interview, 26 November 2008).

Figure 5.2: Small Sized Fish as *Pla Ruam*

Mr. Waipot, the community leader concluded at last that “villagers of Hadpana love their living place and guard the environment with zealous care because this area is fertile and can provide them with long-term benefits. All benefits we gain are from what we’ve done. If we’ve done it, it benefits us. This is normal. Moreover, the benefits we gain from the project are very obvious so villagers willingly accept it” (Waipot, Interview, 26 November 2008).

2. Strong Leadership

The community leader is a prominent player in the success of a fishing community as mentioned in the criteria of the Department of Fisheries' selection of an area for establishing a model fishing community. The potential of the community leader has a strong effect on the participatory aquatic animal resource management since the leader must be the one persuades and steers other members to follow the

principles of the participatory aquatic animal resource management; the leader is also the one who has power over the use of the resources. In a social unit, a community, the leader can be categorized into two types: a natural leader and a formal leader. The formal leader is appointed under the process of the state to administer a unit that he/she is appointed to, while the natural leader has no authority from the state, but has intrinsic leadership qualities that others respect and follow.

The leader of the Hadpana community is Mr. Waipot Nangnoi, who was elected by the vote of other villagers when the Department of Fisheries established Hadpana as a model fishing community. The position of Mr. Waipot is only the leader of the Hadpana model fishing community project, who administers the participatory aquatic animal resource management in the area under the community rights that the Department of Fisheries granted him. Mr. Waipot's position, however, is not a part of the local administration organization; his power is only exercised under the administration and management of the aquatic animal resources of the model fishing community project.

Prior to the Department of Fisheries establishing the project, the position of the fisherman's leader in the area of Hadpana was not appointed formally by the Thai state unit, but rather the leader arose through the natural leadership possessed by a man in the community who other members accepted and respected due to his influence among the group of fishers. The former leader of Hadpana fishers was Mr. Phra who is Mr. Waipot's father. Mr. Phra was respected as the leader of the fishers for more than 10 years prior to transmitting the position to his son Waipot, who was appointed formally later. The Nangnoi family is considered to be an influential family in the area of Hadpana since they own one of the largest fish-trading rafts in the upper area of the Srinakarin reservoir; they also organize fish product transportation to many fish markets in both Kanchanaburi and other provinces. Hadpana villagers refer to their leader as '*Tau Kay*,' which literally means the entrepreneur, but in the case of Hadpana, the villagers consider the leader to be much more than just a normal entrepreneur. The characteristics of the leader fall in line with the ways of the local influential man that in Thai language is referred to as *Phu Mi Ittiphon* or *Chao Phor*. Generally, the definition of *Chao Phor* is understood as a man who has a high economic status and influence, or special authority and ability to control businesses in

a successful manner; however, this definition carries quite a neutral meaning. The definition of *Chao Phor* also indicates a person who has a special personality characteristic that causes him/her to be highly revered by members of the community, in Thai language (*Parami*), which further allows them to administer their leadership as they choose (Suwanna et al 1992: 235).

Tau Kay, in the context of the Hadpana villagers, holds the definition of an economically influential man in the community who has the power to assist community members who are in need. The fish-trading raft of the community leader also maintains a convenience store that is the only store in the Hadpana area. The relationship between villagers and their leader as an influential man or *Tau Kay* is dependent upon the fish-trading raft and the convenience store. For example, local fishers do not have large amounts of expendable capital to invest in expensive products due to the fact that the income of fishers is always uncertain; therefore, fishers who do not want to be indebt will not spend extravagantly. However, in some necessary situations that fishers have to buy new fishing gear and accessories, the *Tau Kay,* or the community leader, will assist the villagers. The investment for a seine net, which is the main type of fishing gear used in Hadpana, costs about 3,000-9,000 baht depending on the size of the net; moreover, the engines for long-tailed boats and even the boats themselves cost between 50,00 and 20,000 baht. Due to the high prices of these products, it can be quite difficult for fishers to pay for everything at the same time; hence, they will ask the leader to assist them and lend them money to purchase what they need. *Tau Kay* will invest in the gear and accessories for the fishers in exchange for an amount of fish that is equal in worth. Moreover, fishers can pay off the debt by making small payments time to time when they can. For example, Mr. A made a deal with the leader Mr. Waipot, to borrow 15,000 baht to pay for his boat; Mr. A wanted to pay the money back in six installments of 2,500 baht each with the income he made from his catch. The leader agreed to accept six payments of 2,500 baht until he had been repaid for the investment; if the income of Mr. A's catch at any one time was more than 2,500 baht, the extra money would be given to Mr. A as his own income.

The investment did not carry any interest and the fisherman was only required to repay the amount of money that he was actually lent. The question is, how does the

leader benefit from this kind of action? The answer is that the leader, when dealing with the middlemen who sell the fishing gear and boats, will receive a discount and then gain profit by charging the fishers the original price prior to the discount. Moreover, the leader's benevolence and willingness to assist the fishers will cause him to be highly revered by the villagers; therefore, villagers will present some actions of gratitude in return to the leader. In order to represent their gratitude to the investor, fishers of Hadpana will sell their fish only at Waipot's fish trading raft, and buy accessories at his convenience store as well. It can be said that the leader is the connector and middleman between the city and the Hadpana community; he can order the products that the villagers desire and also bring products (fish, and forest products) from Hadpana to other areas. However, it should be stated that this kind of behavior does not occur only in Hadpana, but it also occurs in the relationship between villagers and influential people (who are mostly fish trading raft's owners) in many communities within the Srinakarin Reservoir (Chaweng, Interview, 14 August 2009).

Due to the relationship between villagers and their leader discussed above, the success of Hapana's management depends highly on the strong leadership of the community leader and the control he posses due to the villagers' gratitude and attitudes towards him. From the interviews with villagers, it was mentioned that their leader is a very good man and serious about the development of the Hadpana community to be a model fishing community where villagers can participate in the management. Because the leader is highly revered by the villagers, he holds influence over and has the power to control the villagers. The aquatic animal resource management of Hadpana is quite effective because of the villager's trust in and respect for their '*Tau Kay,*' or leader. Moreover, the leader further uses his ownership of the fish-trading raft to maintain the regulations established for all villagers. For example, regulations such as the prohibition of using small meshed seine nets and catching rare fish can be monitored since the raft owner will not buy any fish prohibited by the Department of Fisheries and the raft owner will not buy any fish from villagers who use seine nets with a mesh size less than 7 centimeters. Villagers will also keep an eye on someone using small-meshed seine nets and inform the leader about their actions; therefore, the leader will know who is breaking regulations.

Regarding fish that are too small in size, the fish trading raft owner will buy the fish, but he will pay only a very cheap price (8-10 bath per kilogram) for the product; thus, Hadpana villagers choose not to catch small fish to sell since they are not worth the expense of energy and time. “We use seine nets to catch the big fish, catching the small ones is not worth the effort. Using the big nets only to catch the big fish is better”(Nam, Interview, 25 November 2008). The leader enforces the regulations effectively by his use of the fish-trading raft as a mechanism to support the enforcement.

In fact, villagers do have the freedom to sell their fish wherever they want; they can choose to sell their fish at *Pak Lam* or any other place. However, the cost of the gasoline needed to travel to another fish-trading raft is fairly high since the closest fish-trading raft at *Pak Lam* is about 8 kilometers from the Hadpana community. While it is not compulsory for villagers to sell fish at Waipot’s fish-trading raft, they are willing to do so since they have a strong relationship with *Thao Khao* and are dependent on him for assistance with money loans at times. The *Tau Kay* also needs villagers to sell fish at his raft since the more fishers who sell fish at his raft, the more income he will earn. Again, villagers mentioned that the price set by the leader is acceptable and just; they have in the past experienced bad deals at other fish-trading rafts where the price was lower than usual, but this has never happen at Waipot’s raft. Moreover, the benevolence or *Bunkhun* in their relationship constructed by the leaders support benefits the leader in both his business and in the management of the model fishing community. The strong position the leader holds is rooted in the trust of the villagers and highly affects the success of the aquatic animal resource management in the Hadpana community.

Since participatory aquatic animal resource management requires the participation of local villagers to manage the use of resources, all regulations must be established and enforced by local villagers. The use of both power (fish trading raft’s regulations) and altruism (creating a relationship based on benevolence) by the community leader causes the regulation enforcement to be very effective as the villagers are under many necessary conditions bonded to the leader. Again, the leader also presents himself to be a good example for villagers to follow by not using his power to take advantage of, or break regulations for his own benefit. Moreover, he

dedicates his monetary resources towards improving the aquatic animal rehabilitation project by paying for all materials needed to build floating baskets and gasoline to transport the fish from the Department of Fisheries without any personal benefit. Mr. Waipot stated that, “managing aquatic animal resources as a model fishing community needs to be sacrificial since there is no obvious benefit (money) for villagers who participate in the project, but we (villagers of the Hadpana community) believe that we are doing a good thing for the future of both fishers and nature. While it is true that we are afraid that we could be relocated again if we do not administer the project well, we also love our living place and want to improve its conditions”(Waipot, Interview 28 August 2009). The strong leadership of Mr. Waipot Nangnoi, the leader of Hadpana community, is a mechanism that creates effectiveness in the participatory aquatic animal resource management of Hadpana as a model fishing community.

Figure 5.3: Waipot Nangnoi, The leader of Hadpana model fishing community

Apart from the personality properties of the leader, the relationship between the leader as *Tau Kay* and the villagers regarding the fish-trading raft and sale of products further supports regulation enforcement. The use of this compulsory condition to control the villagers’ behaviors is quite effective; however, the system

still requires a strong leader to control and enforce regulations. Though the position of a model fishing community leader is delegated through an election by the community members, the man who is elected must have a high influence and economic status that draws support from the villagers. Waipot and the villagers also know that a strong leader is one of the mechanisms that causes effectiveness in the Hadpana management; therefore, he prepares for the future by teaching younger members of his family about every aspect necessary for maintaining the Hadpana fishing community to be a successful model fishing community in future generations.

3. The Building of Community Discourse and Self-Organization

Two years after the establishment of Hadpana as a model fishing community, the community has reached a level where all members accept the management of the aquatic animal resources by the participation of its own members. The establishment and enforcement of the regulations by members is the final stage of participatory aquatic animal resource management. Hadpana community, with the Department of Fisheries, has made an attempt to develop this model fishing community to be a formal community organization. The status of a model fishing community, in fact, holds very low power for dealing with external authorities (both state and private); the enforcement of regulations can be applied only to normal villagers and not to other influential people.

Under the participatory aquatic animal resource management principles, the change from a free access fishery to a controlled fishery can occur immediately depending on the fishing rights that are established under the system of the participatory aquatic animal resource management (Kangwan 1998: 18). As mentioned earlier, the participatory aquatic animal resource management is the change from the aquatic animal resource's status of public property, which is openly accessible to all, to that of communal property that belongs to a local community. In order to construct a community that can manage its own resources, community rights must be involved directly in the situation since the community must possess the rights to represent the community's potential to manage its own resources.

Principally, the participatory aquatic animal resource community strives to delegate rights to local communities to manage the resources in their own areas. The

participation of villagers entails that they have rights over the resource management and the ability to choose their own methods of management. According to the policy of the establishment of a model fishing community project, fishing communities hold the most important role in aquatic animal resource management. The enforcement and control of the use of resources becomes the responsibility of villagers directly as they change their status to be not only that of users, but also owners of the resources. These mechanisms of resource management used by the villagers are quite effective amongst the Hadpana villagers, but are quite useless towards external powers.

The Department of Fisheries emphasized that under the community rights, the villagers have the right to manage the resources and become owners of the resources; however, though they have legal rights to manage the resources, they have no practical power to enforce the regulations and control external powers. The process of developing Hadpana community into a community organization; thus, began to deal with those external powers. In the past, villagers in the Hadpana community began to control destructive fisheries in the area by themselves in response to the fact that they were being negatively affected by these methods. Prior to the establishment of the Hadpana model fishing community, this group of fishers did not gather together as a community; they simply lived in close proximity to each other. The status of Hadpana did not fall under the definition of the term *community* at that time; in fact, Hadpana community did not even have the status of *village* since there were very few residencies with a house number registered to the SAO. Hadpana came to be a community as a direct result of the establishment of the model fishing community project.

As mentioned in the beginning of this chapter, the Hadpana villagers attempted to prohibit any practices harming aquatic animal resources and the environment within the area, but they held no legitimate power and rights to manage the resources. The Department of Fisheries later decided to develop Hadpana according to the establishment of a model fishing community project. In the very first period of development, although the Hadpana community theoretically held the most important role in managing the aquatic animal resources in the area, the Department of Fisheries, in practice, took care of the most important actions such as choosing fish species to be raised in the floating baskets and enforcing the Thai state laws on

fisheries. The Department of Fisheries, in other words, managed the resources while the villagers' methods of management were developing. During the first period of development, the Hadpana community seemed to be only a community that raised fish species specified by the Department of Fisheries to be released into the natural waters. From the viewpoint of outsiders, the community members seemed to have virtually no power or influence in the area. The steps that must be taken to establish a model fishing community that manages aquatic animal resources by the way of participatory aquatic animal resource management encompasses much more than simply closing the area to exclude outsiders. The process needs the participation of local villagers and co-operation between villagers and state officers at a very high level in order to establish a community that can participate in the management effectively. The strength of the community in aquatic animal resource management is crucial for success; only the legitimate authority will have rights to manage the resources; therefore, the community must represent its ability to work together, and its strength of management in order to gain legitimate power.

The discourse of the mode of community is raised to upgrade the status of the group of fishers to be a community. The mode of community is utilized as a discourse for the people living in the area; this discourse requires the community to manage the resources within their area according to Article 66 and 67 of Thai Constitution B.E. 2550. The sense of community and community rights was therefore used as the discourse to construct 'a social institution' as a mechanism and regulation to re-manage the relationship in the resource management. The mode of community in the case of the Hadpana community is not by any means static, but it is an active and dynamic player in the context of power relations that adapts and contests with external authorities to seize or keep its social space. The construction of Hadpana community is quite similar to the approach of institutional resource management, which focuses on the co-management between local communities and stakeholders, as this approach is structured around the concept that the resource management does not belong to solely the local community or stakeholder, but the management should be based on a system of co-management by constructing a social institution to manage

the resources[22]. The Hadpana model fishing community is not a unit separated from other parts of society; however, it is related with many units through the form of co-management.

Hadpana villagers and the Department of Fisheries officers, the most important stakeholders, know that the construction of and acknowledgement of the status of Hadpana community and the villager's community rights is necessary for the success of the participatory aquatic animal resource management since the acceptance of the others highly affects the strength and construction of a community organization.

The strength and construction of a community to achieve power requires the villagers' sense of belonging as resource owners. If the community has constructed a sense of belonging, the next step in the process is that the community will find a way to achieve this power (Piyaporn 2007: 236). The beginning of the establishment of a model fishing community requires co-operation between villagers and officers firstly, but in this process the participation of villagers must be at a high level in order for them to share ideas with the Department of Fisheries' officers. Hadpana succeeded in this process since stakeholders and villagers strived to understand each other and the principles of the participatory aquatic animal resource management. In fact, the social relationships amongst the Hadpana community are quite strong; the participation of the community and the villagers shows that they are attentive, charitable, generous and benevolent to each other. It is very normal to see Hadpana villagers helping each other to load products from the big boats coming from the city to the store of the leader and every time accidents occur they willingly go help their neighbors without reluctance. Furthermore, every time that a community member fixes his/her floating rafts, almost all members of the community will come to assist them. Because of the way of life that the villagers lead, one that is far removed from the city, dependency on each other and the necessity to lend each other a helping hand is very important to their livelihood. Living in this type of environment alone and without others you can depend on would be very difficult, as some activities are dependent upon others assistance and require the strength of more than one man. Gathering together as a

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22 See all approaches toward the studies of the resource management in Anan 2000: 5-24

community to help each other is the social way of the Hadpana villagers. The unity of villagers is important and allows for the community organization to be based upon a strong social relationship; therefore, Hadpana community was able to raise the strength of their community to a high level.

Principally, the participatory aquatic animal resource management is the transformation of the aquatic animal resource's status from that of public property to one of communal property. The participation of local villagers was important to making the management successful. Hadpana villagers have a unified sense of belonging and feeling that the aquatic animal resources in the area belong to their community; therefore, they are responsible to carefully manage it and willingly participate in the resource management. The Department of Fisheries officers are responsible in the Hadpana model fishing community for dedicating their abilities willingly to establish a successful model fishing community; however, the officers understand very well the principles of the participatory aquatic animal resource management; therefore, they play their roles as facilitators and leave the rest to the villagers. The officers always emphasize this principle when they instruct the villagers and the outcome is quite positive as it allows for the Hadpana villagers to follow the Department's procedures to develop their community into a community organization. The awareness of the effects of destructive fishing methods further stimulates the Hadpana villagers to strengthen their community in order to take care of their aquatic animal resources within the Hadpana area to guarantee that they will live their lives as fishers comfortably in the long run. The Hadpana fishers do not live rich lives, but almost all villagers can live their lives quite comfortably; that is why the villagers love their place and want to maintain their way life by following the principles of the model fishing community.

The sense of belonging and the real participation of villagers together with the determination of officers are blended together to develop the Hadpana community to be more formal and to have more power to deal with external powers. The seriousness of the participation of villagers gathering together as a group or community organization called 'Hadpana model fishing community' has more influence than if they were established by the Department of Fisheries without their own participation. According to the community rights, a community has rights to manage the resources

in their area as is stated in the Thai constitution; it is crucial that the local villagers realize this aspect of the community rights and are stimulated to build a strong community organization. Villagers of Hadpana realize their rights and also exercise their power over the resources in practice if someone attempts to use them illegally. The unity of villagers is the basis of the community organization construction and the community organization of Hadpana has developed to be more formal by creating administrative positions within the community who are responsible for each kind of activity. Nowadays, the Hadpana community has Mr. Waipot as the formal leader and the head of the community. Mr. Tiang and Mr. Nit, two of the most respected and influential fishers of the community, are appointed as head committees together with Mr. Waipot and are responsible for controlling and enforcing regulations, dealing with external authorities, and resolving conflicts between villagers; these people are so respectable and influential that only they can do such things. Another appointed position is the community's committees who are chosen from members proposed by the villagers. There are 8 committees appointed for this position and they are responsible for conferencing with the Department of Fisheries and the Royal Forest Department's officers and announcing the results of the conferences to the Hadpana community. Moreover, the Hadpana community has begun to create a list documenting the number and species of fish caught by villagers. This information must be reported to the Department of Fisheries in order to represent the situation of the fish in the area accurately. Moreover, the information will be very useful for estimating the results of the model fishing community project in the future.

The Hadpana community organization is therefore more formal than at previous times; together with the determination of villagers gathering together, the management based on unity, and the officers who understand the situations and the principles of community-based fishery management, Hadpana community organization has become a strong and powerful force who can negotiate with external powers or those who wish to illegally seize the community's resources. The strong community organization also gives confidence to the villagers that as a model fishing community they have full rights and power to manage aquatic animal resources within their area. With the strong background and social relationship of Hadpana, the development of the community organization can run quite successfully. The key is

that the community knows how to exercise their power by coming together under their community rights and the mode of community to protect the resources in their area.

Nevertheless, the future is still questionable as there are more functions beyond the management of the Hadpana community that involve external powers such as officers' corruption that can lead to destructive fishing practices in the water source over *Ong Thang*. The development of the community organization; therefore, should be expanded to other communities in order to create a network of fishing communities using participatory aquatic animal resource management to construct the effectiveness of fisheries holistically; however, the mode of community in other communities around the area is still weak and needs time to develop. The co-management of aquatic animal resources in the upper Srinakarin Reservoir still needs time to develop before the expansion of management as a network of model fishing communities.

5.1.2 External Mechanism

1. Mutual Co-Operation with the Department of Fisheries Officers

Another important factor causing the management of the Hadpana community to be effective is the good relationship between the villagers and the Department of Fisheries' officers. Hadpana villagers indicated that the officers of the Department of Fisheries working in the area recently maintain a good relationship with them since the officers understand the situation of the Hadpana villagers who work only as fishers, i.e. the officers make compromises with the Hadpana villagers when needed. For example, during the spawning season, 16 May to 15 September of every year, fishers cannot legally use some types of fishing gear e.g. seine nets and *Yor* to catch fish. However, during this season Hadpana villagers have a higher privilege than other communities since they are granted rights by officers responsible in the Srinakarin Reservoir as a compromise to use these types of gear that are prohibited to catch a limited number of fish in order to earn a living. This is due to the fact that as a community sustained only by fisheries, if they cannot fish effectively during this season, they cannot earn a living.

This compromise between the officers is an attempt to decrease conflicts with the villagers. If the officers were to enforce these regulations strictly upon to the villagers; surely, the villagers would be forced to find other ways of gaining income such as smuggling fish and gathering forest products illegally. The compromise serves as a means of providing the villagers with the opportunity to earn their living in the usual way based on an understanding between the two groups. On the other hand, the compromise facilitates the work of the fisheries patrol since Hadpana villagers, in exchange for the privilege they get by following the regulations strictly, willingly follow regulations against placing seine nets in every stream and using more than 5 seine nets at a time. Nit Parnkerd, a respected man and a committee member of the Hadpana community, stated that "the villagers know that the privilege given by the officers is not according to the law, but we (villagers and officers) negotiate to understand each other's situations. They give us an opportunity to make a living, and we will in turn respect them by not practicing any acts against the regulations and the deal. In fact, the villagers do not want the fisheries patrol to come to the area frequently; therefore, following regulations and the deal is the best way to construct a trusting relationship with the officers so that they do not need to come to the community often".

Due to the understanding between these two groups and their solid relationship, they are open to share opinions and discuss issues with each other in order to solve any problems or conflicts that could arise. Community knowledge regarding fish species and the eco-system of the area is represented through the villagers' practice of choosing fish species to raise and release, prohibiting some modes of fisheries, and determining regulations. The participation of villagers is also shown to the officers by the fact that they draw upon their knowledge and are ready to argue with the officers in the case that they do not agree with their actions; in response, the officers accept the community knowledge and approach these situations with an open-mind ready to listen to the villagers. Therefore, the participation of the villagers is at a high level and the co-operation amongst the two groups works without problem due to this mutual understanding.

Villagers of Hadpana affirmed that the set of officers in charge are respectable because they understand the necessities of the villagers and are flexible

towards some acts that do not affect the holistic situation heavily. The reciprocal relationship between these two groups allows for effectiveness in the aquatic animal resource management of the Hadpana area since villagers follow the regulations strictly according to the compromises and the awareness of the Department of Fisheries officers. The relationship between the Hadpana villagers and the Department of Fisheries officers is still based on the principles of participatory aquatic animal resource management and supports the fact that a good relationship between villagers and officers will allow for effective co-operation by blending of the two groups who possess different forms of knowledge and skills. These two groups hold the most important roles in a successful community-based fishery management village (Kangwan 1998: 23-24).

Anan (1995) proposed that the main factor causing a local community to co-operate in resource management is that villagers benefit more from common benefits in the long run than from using resources individually. However, if the state unit does not accept the community rights legally, this act will reduce the potential to manage the resources of the local community. On the other hand, the acceptance from the state units will create confidence amongst local villagers and strengthen the community's ability to manage its resources. The creation of a social institution as a mechanism to manage the relationship between humans and resources, like the construction of the Hadpana model fishing community, must be accepted formally. The Department of Fisheries is a state unit who guarantees the status of the Hadpana community as a social institution to manage aquatic animal resource legitimately and legally. Though the participatory aquatic animal resource management raises the local fishing community to hold the key role in the management, it does not raise it to a level independent from other units of the society. The concept of Hardin's tragedy of commons (1968) states that successful management cannot be achieved solely through the co-operation of villagers; an external agency (e.g. the Department of Fisheries) is further required to monitor and enforce any agreement to restrict harvesting (Swanson 1996: 32-35). The co-operation of both Hadpana villagers and the Department of Fisheries officers thus is necessary to guarantee the security of the community-based fishery management and prevent the open access status of aquatic animal resource management.

However, there is no research on the effects of fishing during the spawning season. The consequences of the aforementioned compromise, allowing villagers to fish during spawning season, are at this time unknown and it is still questionable what would happen if the Department of Fisheries were to enforce the laws upon the Hadpana community strictly.

In conclusion, the Department of Fisheries, as a stakeholder, undeniably holds a high influence in the resource management of Hadpana due to the fact that the department is the most important player in the construction of Hadpana to be a model fishing community. The Department of Fisheries is responsible for instructing villagers of the principles of participatory aquatic animal resource management and resource conservation, and consulting the community to develop the management further. Though the officers became only facilitators to the community according to the principles, they still have the right to exercise their power against any deviance against regulations established by the Hadpana community and the law of fisheries. Moreover, the acts in the past of the Department of Fisheries' officers are a prominent factors aimed at encouraging villagers to follow the norms of resource management. Together, with the strong relationship the officers have with the villagers, exists an interdependent relationship between the villagers and the officers that facilitates effective aquatic animal resource management and positively benefits both groups in the area.

2. External Pressure

The fear of negative sanctions from the stakeholders like the Department of Fisheries and the Royal Forest Department is also a mechanism that promotes the co-operation in the resource management of the Hadpana villagers. The fear of the negative sanctions stimulated Hadpana villagers to follow the regulations as a defense mechanism aimed at avoiding punishment by the stakeholders that could affect both individuals and the community. There are two origins of Hadpana villagers' fear that are:

1. Practicing destructive fisheries is not worth the cost that fishers must expend if they are caught by the fishery patrolmen and policemen. The fisher's boats and all fishing equipment will be seized and the fishers will be placed under

accusation forcing them to go to court for their actions. The villagers stated that the actual fine they are faced with if caught is not that much, but the court fee is quite high and the compensation to reimburse their boats and equipment seized by the policemen and patrolmen is always exaggerated by those authorities in order to get more money from the villagers. Moreover, income gained from the catch is not worth the risk.

2. The second factor is the possibility of expulsion from the area. Hadpana villagers are aware that the Royal Forest Department has the right over the area to expel fisherman from the Hadpana community. The establishment of the Hadpana community to be a model fishing community is a guarantee that the community can remain settled in the Hadpana area, since the Department of Fisheries requires the participation of local villagers to manage the aquatic animal resources. For this reason, villagers are motivated to co-operate positively in the aquatic animal resource management as a means of representing the positive effects to the state. The project serves as a means of guaranteeing that their settlement is useful for the Thai state's policies towards resource conservation. The co-operation of villagers; therefore, is supported by the fact that they do not want to lose their living space and be forced to settle in a new area; thus, they choose to do their best to support the project that functions as a fortress for dealing with the external power that could potentially expel them from the area.

Socialization of the Hadpana community also involves the consequence of the formal social control by the law toward fisheries. The fear of the negative sanctions from the past, that are still effective in the present, has a strong influence on Hadpana villagers; though they are instructed by the Department of Fisheries officers about the principles of participatory aquatic animal resource management, the principles are only a small composition that can create conservative conscience to only a small group of villagers and their families who used destructive methods of fishing in the past. The possibility of losing their place to earn their livelihood as fishers is an important factor prompting villagers to follow the norms. Due to these three reasons of awareness regarding earning the opportunity to live in the sustainable area; the state does have power over the area and can exercise it at anytime; therefore, the desire of the villagers to maintain a successful model fishing community is in some

ways a defense mechanism towards the Royal Forest Department who has the legitimate power to repel them. Social control from the past has had positive effects in the present by constructing awareness amongst the villagers in order to force them to follow the present regulations as norms. Hadpana community socializes both scientific knowledge constructed by the officers, and facts from their own experiences, as reasons to not be deviant to the norms of the community and maintain their livelihoods.

The fear of sanctions in both formal ways (legal punishment) and informal ways (possibility for hardship in the future if they do not manage the resources properly) is rooted deeply in the Hadpana villagers' consciences. The aforementioned studies show that, social control by strict regulations is an effective means of controlling villagers' resource management because it entails the awareness of being punished in one way or another, i.e. being fined and facing boat and equipment seizure, or being repelled from the abundant area such as Hadpana. The villagers are very aware of the consequences of these negative sanctions encouraging the effectiveness of the management of Hadpana as a model fishing community. In other words, villagers realize that following the norms of the community's resource management will allow them to live a good life as fishers and is more beneficial than making a large income at one time by braking rules that can lead to the loss of everything.

5.2 Conclusion

As a newly-settled fishing community, Hadpana community constructed its own way of aquatic animal resource management that is not based on traditional knowledge and customs, but relies on the collective benefit in the long run of all villagers who believe that they will gain more benefit and maintain better lives in the abundant area of Hadpana by following the community's regulations. Moreover, the conscience toward the resource management constructed through the awareness of negative consequences and sense of belonging of villagers who love their place is also a mechanism assisting social control of the Hadpana community to work successfully.

Moreover, the strong leader, who enforces regulations accepted by all members, is another key mechanism for the effectiveness of the Hadpana community. However, though the Hadpana community's participatory aquatic animal resource management is quite effective in the sense that the community has strength to manage its own resources and enforce regulations effectively, which is clear due to the fact that the numbers of fish resources in the area are increasing, (measured by the villagers' own observations that they can catch more fish and earn higher incomes than in times prior to the community becoming a model fishing community), other obstacles in Hadpana do still exist. These problems could potentially harm the community in the long run since the most prominent obstacles are those created by authority and corruption, which cannot be solved under the villagers' management of the fishing community. To solve these problems, sub-district administration organizations and the Royal Forest Department should take part as stakeholders since they are directly involved with the obstacles, but they, in reality, do not pay enough attention to these problems even though they are within the boundaries of their power. Both Hadpana villagers and stakeholders still have much work ahead of them in order to successfully develop their participatory aquatic resource management in the future.

With the co-operation of the Department of Fisheries' officers, who are in charge during the years of development and responsible for the establishment of the model fishing community project (2006-2009), Hadpana community can develop itself to be a model fishing community that can manage its resources by the community's participation. It is undeniable that stakeholders, like the officers, have a very important role; moreover, the methods and practices followed by the officers must follow the principles of the community-based fishery management and they must allow the villagers to participate in these practices. The key to success is based on the co-operation between villagers and officers who understand each other well.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1 The Conclusion

The consequences of the age of development over the past 30 years are physically represented through many mega projects such as dam building throughout Thailand. In trade for flooding and sinking forest areas underwater, dams are created and their reservoirs are used for many purposes such as generating electricity, irrigation, transportation, tourism and fisheries. Fisheries located in the dam's reservoirs have become an alternative for fishermen; their move into the dam's areas occurred systematically after the dams were completed due to the fact that the dam's construction created new opportunities for fisheries within the reservoir. Srinakarin Reservoir, which has the highest capacity of any reservoir in the country, is an ideal location for operating a reservoir fishery due to the high number of fish in the area. The fish in the Srinakarin Reservoir originated from both nature and the release by the Department of Fisheries of species into the area. Therefore, many fishing communities and fish trading rafts have settled in the area of the Srinkarin Reservoir for the purpose of gaining benefit from this opportunity. Nevertheless, yields in new reservoirs are initially quite high as the nutrients are released from the recently inundated land; however, the yields usually decline after the first five years or so as the nutrient supply is used up, then stabilize at a lower level (Mekong River Commission 2008, 6). Because of this characteristic, along with the destructive and over-fishing methods practiced in the reservoir, the number of aquatic animal resources has drastically decreased. At the same period of time that the trend of an increased interest in natural conservation began to be widely spread throughout the world, the problem of solving the aquatic animal resource's crisis was also seriously considered by stakeholders i.e. fishermen, fishing communities, the Department of Fisheries, and involved organizations in Thailand. The solution reached by the stakeholders was that the fishing community must participate in the aquatic animal

resource management in its own area through community-based fishery management, as this will be the most effective way to manage the aquatic animal resources.

The Thai constitution B.E. 2550 granted community rights to local communities in order to allow them to manage their resources in their own way. The approach towards resource management being lead by the local community strived to find its space in Thai society and was finally accepted after the constitution was granted. The participatory aquatic animal resource management by local communities in both freshwater and coastal areas has drawn much attention and notice and has therefore been widely researched and studied. The cultural aspect acting as the root of these communities who have been settled for long periods of time is an important key factor leading to the resource management's effectiveness. In other words, the knowledge system that is the grounds of the resource management is based on traditional knowledge, customs, beliefs, and rituals. However, in the case of the reservoirs, and the settlement of the villagers who come from many diverse backgrounds, it is not possible to construct such a knowledge system like the old settled communities mentioned above. The old settled communities found that many researches and projects publicly represented their mechanisms and success as well while there are very few researches and projects on the newly-settled communities. The establishment of the model fishing community project organized by the Department of Fisheries is aimed at establishing a fishing community that can participate strongly in aquatic animal resource management. The responsible units are 25 fishery patrols of 25 provinces. The objectives are to establish at least one model fishing community in each respective area. From the list of the project's sites, most of the sites are settled in reservoirs over dams where the fishing communities are surely newly-settled communities (See the list in Appendix II). Undeniably, reservoirs created important and generous fishing spots but are also problematic for management purposes; therefore, this project intends to solve the problems of aquatic animal resource management and create sustainable fishery practices within the reservoirs' areas.

Hadpana community is one of the communities selected by the fishery patrol of the west under the Department of Fisheries to be a model fishing community in the establishment of a model fishing community project. Many scholars and state men

visited the area in order to study its management, and the state units accepted this community as a community with effective aquatic animal resource management. Though Hadpana's resource management is not based on the roots of traditional knowledge and customs like old settled communities, the community succeeded under the criteria of the Department of Fisheries to be a model fishing community with effective management of its aquatic animal resources. Hadpana community constructed its knowledge system on aquatic animal resource management under internal and external mechanisms that are:

1. Internal mechanism

-The Social Control: villagers created regulations based on the community knowledge and in agreement with the Department of Fisheries in order to find the best solutions for controlling fishing practices in the area. The strict enforcement of regulations originated from the awareness of villagers drawn from their experiences and transmitted to future generations as a means of avoiding previously made mistakes from occurring again. The villager's experiences taught them that destructive fishing practices and over fishing are not worth the expenditure and also create long-term destruction in bountiful fishing areas; therefore, Hadpana villagers follow the regulations as a means of avoiding such consequences. Again, the regulations established by the villagers themselves are more effective than the ones established by external authorities, and all community's members agree to follow their own regulations. Conscience and sense of belonging of villagers are key factors in managing the resources successfully since they know that following the regulations will have greater benefit than not adhering to them. .

- The strong leadership: Strong leadership within the community is established through the relationship between villagers and the community leader, known as the '*Tau Kay*,' or economic and social influential person of the community whom villagers are dependent on for his economic and social status. Because of this relationship, the *Tau Kay* as the community leader has power and influence to control villagers and force them to follow the regulations strictly. His strong leadership; thus, originates from this relationship and the status of the community leader whom the villagers depend on for financial stability. Apart from the aforementioned leader's

status, the leader's characteristics and determination are also important compositions supporting the strength of his leadership. Mr. Waipot, the leader of the Hadpana community, experienced the negative effects caused by destructive fishing methods and over-fishing first hand. Mr. Waipot knows experientially the effects these fishing methods can have on the community and has concern for his business as the fish trading raft's owner; therefore, he is in favor of the establishment of the model fishing community project and dedicated his money and strength towards helping it to succeed. Another reason why he is in favor of the project is in line with the motivations of most villagers in the fact that he is afraid of being expelled from the area causing him to enforce the regulations and control the villagers' behaviors strictly (Waipot, Interview, 28 August 2009). However, with his characteristic and his leadership skills that are decisive and just, all villagers accept and follow him as their leader without any complaints. The acceptance of the Hadpana leader is at a high level because of his status, the important relationship as the *Tau Kay* or influential person, and the characteristics of the leader who never takes advantage of villagers and can be depended on by villagers at any necessary moment.

- The Building of community discourse and entailing self-organization: the mode of community of Hadpana is constructed through the co-operation between the state unit (Department of Fisheries) and villagers in order to facilitate a means of communication that can negotiate with external powers and successfully conserve the aquatic animal resources in the area considered to be the water source of the Srinakrin Reservoir. The status of Hadpana community is created as a community discourse to propose the community rights and local knowledge to have its social space in Thai society. Moreover, the model fishing community status of Hadpana community constructed through the co-management between Hadpana villagers and the Department of Fisheries officers works as a formal social institution and a mechanism for re-managing the resources in the area. This formal status guarantees stability for the management of the Hadpana community. Furthermore, the strength of the community and the determination of the villagers are mechanisms used to construct Hadpana's community organization to deal with the external powers attempting to take advantage of the area such as villagers from other communities, outsiders, and influential people or stakeholders such as EGAT, the Department of Fisheries, The

Royal Thai Forest Department, and local influential persons. According to the principles of participatory aquatic animal resource management, the status of aquatic animal resources has been changed from that of public property to communal property. The villagers' sense of belonging and participation regarding the aquatic animal resources has therefore changed from the status of communal property to one that is strong enough to support the strength of their resource management and construct the community's power. The social relationship between the Hadpana villagers is the essence of the community's strength and determination since the villagers must unite strongly in all their daily activities. The unity of villagers is rooted in their daily lives and their dependency on each other is necessary if they want to live in an environment like that of Hadpana. Apart from such a relationship, the collective benefit villagers will gain from following and enforcing regulations is also profitable for all of them who want to continue living in the Hadpana area. Gathering together as a strong community organization to maintain their status and base of resources is the best way to exercise their power, maintain successful management, and represent their community rights against invaders and outsiders when needed. The unity and determination of the villagers along with the shared sense of belonging regarding the aquatic animal resources in the area is one of the mechanisms and factors that makes the resource management of Hadpana effective.

2. External Mechanisms

- The mutual co-operation with the Department of Fisheries officers: the laws enforced by the Department of Fisheries officers are also under the understanding that the management of the area must be a joint effort and compromise between the officers and villagers making the enforcement easier and successful. However, the ramifications of the compromises regarding the laws and regulations between officers and villagers is still questionable at this point as the results give Hadpana villagers an advantage over other villagers in other communities; furthermore, the effects of operating fisheries during the spawning season, even in very few numbers, might modify the ecosystem. Though the compromise can assist the Hadpana villagers by having a positive impact on their management, its effects are still questionable since it is against the law and there is at this time no research supporting such actions. At this

time, the resource management methods of the Hadpana fishing community have been positive since the number of fish caught by villagers has increased and the fish released by the restoration project are also caught as well. Both villagers and the Department of Fisheries officers consider this to be a positive effect, but with the compromises that could potentially harm the Hadpana area, the future of sustainable fisheries is still under question. Nevertheless, one thing that is certain for the Hadpana management is that villagers will do their best to maintain their community to be successful as a model fishing community in order to guarantee that they preserve the potential to manage and conserve the aquatic animal resources in the water source of the Srinakarin Reservoir. If they can sustain success the Royal Forest Department will have no reason to relocate them from their living place again. In conclusion, they are very pleased with their lives and incomes earned within the spatial potential of the Hadpana area and they do not want to move from their current location; for this reason, social control by regulations set by villagers are very effective because of the awareness they create amongst the villagers regarding the regulations importance.

- The External Pressure: The fear of being punished by negative sanctions as in the past, and the fear to be expelled in the future, is also the stimulation for Hadpana villagers to follow the regulations since they can prove to themselves that they can live with natural resources without its degradation; moreover, their mode of living increases the number of aquatic animal resource in the area as well. These external pressures encourage them to participate in the resource management for their own benefits in the future.

The effectiveness of the Hadpana community's aquatic animal resource management is based on the collective benefit of all villagers (including fish trading raft's owner) that they want to maintain their lives and occupations by following regulations and the modes of resource management constructed by their own community. Though there is no root of management based on traditional knowledge and customs, Hadpana villagers can socialize their members by the awareness of conditions and experiences that are effective in managing the resources.

6.2 Recommendation

Research regarding the relationship between villagers and stakeholders aimed at the goal of understanding its characteristics is important for establishing policies regarding the management's obstacles within the model fishing community. Compromises between villagers and stakeholders consistently occur and are against the law of fisheries. Finding alternative methods for villagers to earn an income during seasons with poor fishing conditions rather than allowing them to practice fisheries in prohibited areas is necessary to solve these problems. The grounds and roots of these problems are very complex and cannot be solved directly by law enforcement; the understanding of the complexity of the relationship between villagers and officers/rangers should be researched further in order to find the most appropriate means for solving these common problems which occur not only in Hadpana, but also in many natural water sources throughout the country.

Creating an understanding between the villagers of Hadpana and *Pak Lam Khakaeng* is necessary for the expansion of the establishment of a model fishing community project in the future. The misunderstanding of *Pak Lam* villagers created a pessimistic perspective of Hadpana villagers and their management amongst the *Pak Lam* people; moreover, there are further misunderstandings regarding the principles of participatory aquatic animal resource management. In order to expand the project, this problem should be solved as soon as possible in order to discourage further conflicts and foster co-operation amongst these two. The stakeholders, like SAO and the Department of Fisheries, should address this issue and try to facilitate the creation of an understanding amongst the two groups.

Comparative studies on other newly settled fishing communities should be carried out as well. Since there are very few researches on freshwater fishery management in freshwater areas like reservoirs, further studies on communities settled in such areas are needed to understand the mechanisms of these communities that will be very useful for the development of the establishment of a model fishing community projects and participatory aquatic animal resource management of Thailand in the future. The co-management between state units and local villagers of newly-settled community like Hadpana can create successful management; this is an

interesting and important point for further study since the state units have been ‘bad guys’ for participatory resource management in the context of community researchers for a long time.

6.3 The Final Conclusion

Researches investigating the Hadpana community are quite interesting and insightful as it is a newly settled fishing community without traditional roots and has been rarely researched or studied previously. This research is an exploratory work to expose and analyze the picture of the participatory aquatic animal resource management of a newly settled community, a community widely accepted as a successful example of the establishment of a model fishing community project. Obviously, the management of the Hadpana community is rooted in three important mechanisms that have a uniform goal of collectively benefiting the villagers. Though it seems like villagers are pushed by an invisible hand to follow regulations and co-operate in the resource management, it is undeniable that they also have their own drive and desire to take care of their living place as well. Many of the insights gained from this research of the Hadpana community can be represented as useful ideas that can be expanded to the studies of other communities with similar characteristics. The various complex relationships of villagers and stakeholders cannot be ignored since they are behind the mechanisms that allow for the success of the participatory aquatic animal resource management of a fishing community. Though stakeholders have a high influence on the success, they cannot operate without the participation of the villagers as the main character. The strength of the community is the most important attribute needed for the community to construct rights and have the power to manage the resources in its own area, it is also the most prominent element leading towards the effectiveness of the management as well.

The case of Hadpana is not however an individual case, the community shares many characteristics with other communities located in reservoirs that have more or less the same process of management, the same mode of living, and foster the same relationships between villagers and stakeholders. Studies regarding the effectiveness of Hadpana as a model fishing community should be expanded in order to develop the other communities in the future according to the objectives of the project. The

knowledge gained from Hadpana can be utilized to establish future model fishing communities where villagers can participate in the aquatic animal resource management effectively.

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APPENDICES

Appendix A

The Announcement of the Ministry of Agriculture 1964

Topic: To Settle Spawning Season of Aquatic animals and to Settle Type, Size and Methods of Fisheries

1. Spawning season in freshwater areas of all provinces is settled from 16 May to 15 September of every year
2. Operating fisheries during this season is prohibited with the exception of:

Operating fisheries with specified types of fishing gear with these kinds, sizes and methods:

1. Every kind of hook except line hooks (*Bet Raw*)
2. *Takrang, Sawing, Chorn, Yor* and *Chanang*[*] with less than 2 meters of mouth size.
3. *Sai, Poong, E-joo, Lun, Pong*, and *Tong*[**]

Operating fisheries with fishing gears is prohibited if using more than 3 kinds of gear.

4. Operating fisheries in designated fish culture areas

Operating fisheries for academic purposes or for the purpose of collecting juvenile for raising larger fish.

Operating fisheries under the textual permission of the general director of the Department of Fisheries.

(Department of Fisheries)

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[*] All kinds are types of fishing gears that use a net as the important feature for catching the fish

[**] Fishing gears in 3 are types of small trapping gear.

Appendix B

The Establishment of the Model Fishing community Project

1. Principle

The Thai state by the Department of Fisheries has established very strict regulations for managing aquatic animal resources for the purpose of increasing the number of species in natural water and promoting activities such as researching, culturing, patrolling and controlling; however, the number of aquatic animal resources is still continuously decreasing. One important reason for this is the lack of participation in resource management by the local community due to the misunderstanding that the aquatic animal resource management is solely the responsibility of the Department of Fisheries Officers.

The Bureau of Fisheries administration and management considers the participation of the fishing community to be the most important aspect leading to the success in aquatic animal resource management through the construction of thoughts, understanding and practices in fishing communities that the aquatic animal resources belong to the fishing communities; therefore, they have to take care of these resources themselves. The fishery patrols thus began the project according to the principle of the community-based fishery management by approaching the community and constructing the participation in management of villagers as a means of establishing a model fishing community that can practice participatory management of the resources effectively. In 2009, at least one community for each fishery patrol unit must be established in order to lead to the success of the aquatic animal resource management as a sustainable fishery resource.

2. Objectives

2.1 To establish fishing communities that can strongly manage aquatic animal resources.

To establish model-fishing communities under the policies of aquatic animal resource management that will become models for other fishing communities.

3. Goal

The goal is to establish model freshwater fishing communities in aquatic animal resource management areas. At least one community/1unit should be established within 2009. The total number of communities will be 25 communities in the 25 areas.

4. Process

4.1 Each fishery patrol unit surveys, researches and analyzes the fishing communities in their designated area to facilitate the establishment project by considering the criteria of a community. The areas that should be considered are:

- Occupation
- Local leader
- Geographical features
- Fishery stock
- Villagers' cooperation
- Economic, social and cultural aspects
- Academic data, involved laws and regulations

4.2 Proceed in the selected community by processes and activities following the theories of understanding, approaching and developing, such as:

- Community approaching: facilitating public relations to construct understanding with the villagers (finding alliance stage)

- Constructing trust: sending officers to participate in the community's activities, offering assistance to the community and organizing forums and conferences to share knowledge (changing thoughts stage)

- Constructing participatory aquatic animal resource management of the community: organizing conferences and finding ways to raise the management of the community to be the most important role (constructing stage)

- Establish a model fishing community: using regulations and plans in practice to succeed in the area to construct a community organization and perform other activities necessary such as aquatic animal rehabilitation projects under the support of external authorities together with the community itself.

- The participation with model fishing communities: sending officers to participate in activities and meetings with communities continuously in order to establish, solve, and develop the management methods with the communities. Such types of activities organized by the Department of Fisheries are:

1. Appointing co-operational persons in the community
2. Setting the project's signs and involved information signs
3. Conferences
4. Aquatic animal rehabilitation projects
5. Appointing committee members (with female members)
6. Supporting alternative jobs to increase incomes
7. Constructing aquatic animal habitats
8. Establishing the community's fund
9. Supporting members to make a list of incomes and expenditures
10. Noting all records regarding aquatic animal resource releases into the area
11. Organize activities to provide knowledge to the villagers
12. Listening to obstacles and assist the community with solving such obstacles.
13. Participating in the community's activities and customs

- Collecting data and analyzing the process so that it may be expanded to other communities as well.

5. Period of Proceeding

From October 2008 to September 2009

6. Site of Proceeding

In responsible areas of the 25 fishery patrol units:

1. The freshwater fisheries patrol in upper north, Lampang
2. The freshwater fisheries patrol of Bhumipol dam, Tak
3. The freshwater fisheries patrol of Mae Guang dam, Chiangmai
4. The freshwater fisheries patrol of the lower north, Phitsanulok
5. The freshwater fisheries patrol of Sirikit dam, Utaradit
6. The freshwater fisheries patrol of Bung Boraphet, Nakornsawan
7. The freshwater fisheries patrol of the upper northeastern, Kanlasin
8. The freshwater fisheries patrol of U-bonrat dam, Khonkaen

9. The freshwater fisheries patrol of Nam Oon dam, Sakonnakorn
10. The freshwater fisheries patrol of the lower northeastern, Nakornratchasima
11. The freshwater fisheries patrol of Lam Nang Rong dam, Buriram
12. The freshwater fisheries patrol of Sirindhorn dam, U-bonratchathani
13. The freshwater fisheries patrol of Pak Mun dam, U-bonratchathani
14. The freshwater fisheries patrol in central part, Ayutthaya
15. The freshwater fisheries patrol of Krasiew dam, Suphanburi
16. The freshwater fisheries patrol of Pasak Chonlasit dam, Saraburi
17. The freshwater fisheries patrol of Chaophraya, Chainat
18. The freshwater fisheries patrol of Khun Darn Prakarnchon dam, Nakornnayok
19. The fisheries control unit of Prasae dam, Rayong
20. The freshwater fisheries patrol of the west, Kanchanaburi
21. The freshwater fisheries patrol of Vijiralongkorn dam, Kanchanaburi
22. The freshwater fisheries patrol of Gaeng Grajarn dam, Petchburi
23. The freshwater fisheries patrol of the south, Suratthani
24. The freshwater fisheries patrol of Pattalung
25. The freshwater fisheries patrol of Banglang dam, Yala

7. Budget

2,520,000 Baht

8. Responsible Unit

1. Public relations section, Bureau of Fisheries administration and management

2. The chiefs of all fishery patrol units

9. Participator under the Department of Fisheries

1. Provincial fisheries officers in the project's area

2. Director of Inland Fisheries Research and Development Center / Head of inland fisheries station in the project's area

3. Director of genetic research center in the project's area

4. Involved and interested units of the Department of Fisheries

10. Expected Benefits

1. To establish a fishing community that can strongly manage aquatic animal resources and serve as a model for other communities

2. To construct a movement of participatory aquatic animal resource management by fishing communities

3. To increase the number of aquatic animal resources in the area

4. To encourage community members to unite and cooperate

5. To increase the socio-economic status of the model fishing communities

11. Estimator

Quantitative estimator: establishing model-fishing communities--at least 25 communities in 2009

Qualitative estimator: the results of the model fishing community's project is the qualified criteria

Appendix C

Aquatic Animal species in Srinakarin Reservoir*

Thai Name	Common Name	Scientific Name
Family Clupeidae		
Siu Kaew	Glass Rasbora	*Corica goriognathus*
Family Notopteridae		
Krai	Spotted Knife Fish	*Notopterus chitala*
Tong Lai	Stripped Knife Fish	*Notopterus blenci*
Salard	Grey Featherback	*Notopterus notopterus*
Satue	Feather-Finned Fish	*Notopterus barneensis*
Family Mastocembelidae		
Krating	Armed-spiny Eel	*Mastocembalus armatus*
Family Synbranchidae		
Lai	Swamp Eel	*Monopterus albus*
Family Cyprinidae		
Siu	Rasbora	*Rasbora spp.*
Krasoob	Transversed-bar Barb	*Hampala macrolepidota*
Vian	Greater Brook Carp	*Tor tembroides*
Saitan Ta Khao	---	*Cyclocheilichthys apogon*
Saitan	Indian River Barb	*C. armatus*
Takoke	Soldier River Barb	*C. enoplos*
Yisok Thai	Seven-striped Barb	*Probabus jullieni*
Sroi Khao	Jullien's Mud carp	*Cirrhinus jullieni*
Sroi Lai	White Lady Carp	*C.lineatus*
Kang	---	*C. molitorella*
Tapian Sai	Golden Little Barb	*Punitius leiacanthus*
Tapian Hangdang	Schwanenfeld's tinfoil Barb	*P. sophoroides*
Tapark	Yellow Tail Barb	*P. daruphani*

* Compiled from the data of the Department of Fisheries combined with the field data by the researcher. There are more species without identification from the Department of Fisheries officers

Tapian Khao	Common Silver Barb	*P. gonionotus*
Tapian thong	Red Fintoil Barb	*P. altus*
Kaem Cham	Red-Cheek Barb	*P. orphoides*
Kramang	Smith's Barb	*Puntiopeltes proctozysron*
Soi Nokkhao, Phrom Hua Menn	Greater Bony-Lipped barb	*Osteochilus hasseltii* *Lobocheilus spp*
Bua	---	*Labeo chrysophekadion*
Ka dam	Black Shark	*Labeo stigmapleura*
Soi Namngurn	---	*L. rohita*
Yisok Tess	Rohu	*Cirrhina microlepis*
Nualchan	Small scale Mud Carp	*Neolissocheilus soroides*
Pluang	Soro Brook Carp	
Family Gyrinochellidae		
Look Pung	---	*Grinocheilus aymonieri*
Family Cobitidae		
Moo	Yellow-tailed Botia	*Botia spp.*
Family Silluridae		
Kao	Great White Sheatfish	*Wallagonia attu*
Kao Dam	Black Shaetfish	*W. miostoma*
Kang Buan	Twisted-Jaw Shaetfish	*Wallgo dinema*
Nue Orn, Dang	Shaeatfish	*Micronema apogoon*
Namnguen	Common Shaetfish	*K. bleekeri*
Family Claridae		
Dook Darn	Walikin Catfish	*Clarias batrachus*
Family Schiibeidae		
Sawai	Striped Catfish	*Pangasius sutchi*
Sangkaward Luang	Siamensis Pangasius	*P.Siamensis*
Buk	Mekong Giant Catfish	*Pangasianodon Gigas*
Family Bagridae		
Kod Luang	Yellow Catfish	*Mystusfilamentus*
Kung	Red-Tailed Mystus	*Hemibagrus wyckioides*

Kayang Kanglai Kayang Baikao, Kayang Thong	Iridescent Mystus Long-Fatty finned Mystus	*Mystus multiradiatus* *Mystus singaringan*
Family Sisoridae Khae	 Giant Bagarius	 *Bagarius yarrelli*
Family Synapturidae Lin Mhaa	 River Sole	 *Synaptura aenea*
Family Anabanitdae Mor Thai Rad	 Common Climbing Perch Giant Gourami	 *Anabas testudineus* *Osphronemus goramy*
Family chanidae Chon Khu Hao, Ron Chon Krasong Chado	 Cobra Snake-head Fish Striped Snakehead Fish Blotched Snake-head Fish Striped Snakehead Fis	 *Channa marulius* *Channa striatus* *Channa lucius* *Channa microlepis*
Family Centropomidae Khaomao	 ---	 Chanda siamensis
Family Nannidae Mor Chang Yieb, Mortiklab	 Striped Tiger Nandid	 *Pristolepis fasciatus*
Family Cichlidae Nil	 Nile Tilapia	 *Oreochromis niloticus*
Family Eleotridae Buu	 Sand Goby	 *Oxyeleotris marmolata*
Family Trionychidae Taparb Taparb Naam Lai	 Common Siamese Soft-Shelled turtle Kanburien Giant Soft-sheled Turtle	 Trionyx cartilaginous Chitra Chitra
Family Palaemonidae Kuung Kaam Kram	 Giant Freshwater Prawn	 *Macrobrachium rosenbergii*

Appendix D

Interview Guide for Key Informants of the Community

1. General Information

- Name, Sex, Age, Education Background, Marital status, Social Status in the Community

2. The Settlement of the Community

- The Move to Srinakarin Reservoir
- The Settlement of Villagers
- The Settlement as Hadpana Community

3. Geographical Feature of Hadpana

- The Settlement and Boundary of Hadpana Community
- The Residency's Settlement
- The Use of Land and Forest
- The Use of Reservoir
- The Use of Aquatic Animal Resource
- The Climate
- Fish Species and Sub-Ecosystem
- Fishery Methods and Fishing Gears

4. Economic Feature

- Occupation, Income, Debt, the Market to Distribute Products

5. Social Feature

- Demography and the Moving
- Education
- Public Healthcare
- Public Utility
- Political Participation and Election of Community's Leader and Committee
- Social Relationship
- Customs, Religions and Beliefs

6. The Aquatic Animal Resource Management

- The Understanding of the Principle
- The Relationship with Stakeholders
- The Activities
- The Obstacles
- The Opinions
- The Anticipation
- The Recommendation

Appendix E

Interview Guide for Stakeholders

1. General Information

- Name, Sex, Age, Education Background, Position

2. The Responsibility Related to Hadpana Community

- Duty

3. The Involvement with the Establishment of a Model Fishing Community Project

- Responsibility
- The Relationship with Villagers
- The Understanding of the Project's Principle
- The Policy
- The Obstacles
- The Opinions
- The Anticipation

BIOGRAPHY

Nuttapol Sothiratviroj was born in 4th December 1979. Granted B.A. degree in Philosophy from Thammasat University with the second class honour in 2002 and continued studying in Thai Studies Program of Faculty of Arts, Chulalongkorn University in 2007.