

## CHAPTER I

### INTRODUCTION

#### 1.1 Introduction

Agro-biodiversity management has been practiced in several places. One of these cases is the floodplain area of the lower Songkhram River basin, an ecosystem that is vitally important to the surrounding villages. The Songkhram River is an important branch of the Mekong River in the Sakon Nakhon basin, Northeast Thailand. Government considers it as a wetland site of international importance (OEPP, 1999a). The Songkhram River Basin covers an area of approximately 12,700 km<sup>2</sup>, it flows through four provinces; Sakon Nakhon, Udon Thani, Nongkhai, and Nakhon Panom. It has long been known for its abundance of resources. The large and widespread annual inundation replenishes the fish, the fertility of soil, and the productivity of the inundated forests. But Songkhram River Basin is one of the poorest areas in Thailand. Most of the development goals for the area set by the government are connected to the enhancement at agricultural and fisheries sectors (Kummu and Varis, 2007). The catchment has mostly been cleared for farming. Nowadays, about 39% is under rice and the balance under upland field crops, with only remnants of forest remaining. About 54% of the lower basin catchment is wetland, including rice fields, that covers 108,000 ha during the June to October wet season (Blake, 2006). Local people in Songkhram River Basin are deeply dependent

on aquatic resources, and are therefore particularly vulnerable to the changes in river flow and availability of aquatic resources. They earn their living through a combination of fishing, farming, and collecting wetland products.

As mentioned above, wetlands provide very important goods and services to the society and help in sustaining critical livelihoods of wetland communities, which can be classified as a) direct use values such as fish, tourism and agriculture; and b) indirect use values such as flood control, and watershed protection (MWBPs, 2003). However, climate change and high levels of human population and usage have led to increasing unplanned development pressures within the wetlands, causing many direct threats to most of the important ecosystems and endangered species for which the region is well-known. This poses a significant threat to biodiversity and environmental sustainability, and thereby to the livelihoods of the people.

## **1.2 Rationale of the study**

The world's population of 6.3 billion people is projected to grow to 9 billion by 2050 (WAO, 2009; PRB, 2009). In the same way, the population of Thailand reached 64.86 million in 2004, with a growth rate of 1.2 to 1.4 percent per year the population is projected to exceed 70 million by 2010 (BOI, 2009). To meet the increased demand for food, more land will be converted to agriculture, and agricultural intensification will increase, thereby increasing the pressure on biodiversity in natural ecosystems. Monoculture farming is recognized as the main driving factor for the extinction of species due to the expansion of agricultural land, which leads to the loss of natural habitats, to the conversion of forested areas into

homogeneous agricultural landscapes with low habitat value for wildlife, to the loss of wild and beneficial species as a direct consequence of agrochemical inputs and noxious practices, and finally to the erosion of genetic resources due to the expansion of improved varieties and more recently genetically modified organisms (Altieri and Nicholls, 2004). Given the expected over use due to growth in human population and predicted environmental change, research is needed to show that how the utilization and conservation of agro-biodiversity can provide sustainable ecosystem services to satisfy both current and future needs in study area. More importantly the lack of knowledge about socio-economic dimensions of agro-biodiversity has constrained the knowledgeable management of valuable resources.

Dong San village, Arkat Amnuai district, Sakon Nakhon is located on catchment of Songkhram River where villagers are used to annual flooding and have adapted their livelihood strategies accordingly to maximize the benefits from wide range of ecosystems, such as seasonally flooded forest (*paa bung paa tham*), reservoirs and natural ponds, and paddy fields (Limnirankul and Gypmantasiri, 2007). People in this village depend on agriculture activities. They can grow rice only one time per year with low productivity, so two thirds of income comes from direct harvest of wetlands, and only one-third from rice cultivation. According to these importance of seasonally flooded forest as wetland and amidst the environment crisis in the Songkhram basin, the villagers have tried to solve the various problems that have arisen. For instance, they have setup local initiative on agro-biodiversity and aquatic resources conservation and utilization. It has been found to be good management in this village.

Precisely the above mention problems should be solved by involving all organization both local administrative and government agencies. Furthermore, the valuation of wetland agro-biodiversity products shall provide additional crucial information for all related stakeholders to better manage this wetland not only for conservation but also using it wisely. The result will show the significant of seasonal flood forest for local people in term of direct use value, an innovative way of using market-based approaches to shape decision-making over change in land use and management to sustainable use of agro-biodiversity in wetland area. Moreover, the result of this study will be applied for the more effective strategy focusing on seasonal flood forest management particularly as comprehensive information.

### **1.3 Objectives**

The objectives of the study are as follows:

1. To identify management and utilization practices of wetland agro-biodiversity resources in Dong San village, Arkat Amnuai district, Sakon Nakhon Province, Thailand.
2. To estimate direct use values of wetland agro-biodiversity products.
3. To explore major socio-economic factors affecting wetland agro-biodiversity resources management activities.

#### **1.4 Hypothesis of the study**

1. The environment and livelihood coping strategies of household influences conservation of agro-biodiversity in study area.

2. The socio-economic characteristics (such as sex, age, educational status, household member, period of resident, income from wetland products) of the household influence small farmer's management of wetland agro-biodiversity in the study area.

#### **1.5 Scope of the study**

This study offers in-depth reports on applied research, analysis and findings about wetland area (seasonally flooded forest) associated with the effort to build quality jobs in agro-biodiversity resources management. Primary data were collected during June 2007 and February 2008. Market price method was used for evaluating the direct use value of wetland products. The direct use value of wetland agro-biodiversity products on this studied is composed of the value of products from fishery (not included the bidding of community's swamp), edible mushrooms, bamboo shoots, wild vegetable plants and earthworms. The study also explores the characteristics of the farm households and farming practices of 60 households in Dong San village including information on general demographics of the households, income and expenditure of individual households, environment conditions in the village.

## 1.6 Usefulness of the study

The target audience includes policy and administrative leaders, academics, leaders in community forestry, community-based organization leaders, and local community members. This study will help to identify factors that influence resources management toward sustainability on small household farmers. Local authorities and farmers jointly develop community action plan through the result of this study. Results of this study will open new ways of dissemination on farming management methods for resources utilization and conservation. Finally, the outcome of this study will introduce to farmers for improving their livelihood.

## 1.7 Conceptual Framework

People and other living organisms share wetlands area as common living space. They have experienced co-evolution along a long time scale. In a macroscopic perspective, the biodiversity change in a wetlands area is the result of both anthropogenic factors and natural environment regime (Figure 1-1). It is well known that natural environmental factors, such as climate and topography, are important in shaping the distribution and interactions of biodiversity and need to be incorporated into the decision making process of wetland's agro-biodiversity resources management. But, the changes of these factors, generally determined by large scale events in space and time. What we can do in the conservation of biodiversity is to regulate the anthropogenic factors. Within a wetlands area, landscapes and their biodiversity components are the results of historical land use practices. Different land

use history results in different biodiversity and the management practices need to cope with the differences in order to conserve biodiversity. Furthermore, local livelihood needs are closely related to the socio-economic context. The change of the socio-economic context can have some effects on the local livelihood activities, and vice versa. For example, the poor communities may depend more on the natural biodiversity resources for food, fiber, medicine, and energy source to use or sell. Poverty alleviation, therefore, can reduce the human pressures on the natural biodiversity resources to some extent. The changes of livelihood needs and the corresponding socio-economic context are relevant to biodiversity use styles and eventually to biodiversity change. Local perceptions are determined largely by the degree of the fulfillment of the livelihood needs and the status of the socio-economic context. Therefore, applied conceptual frameworks of this study on small farmer's management of wetlands area and agro-biodiversity utilization needs to emphasize the livelihood needs, perceptions, and socio-economic context of local community with appropriate consideration of vulnerability context such as the land use history and environment regime.



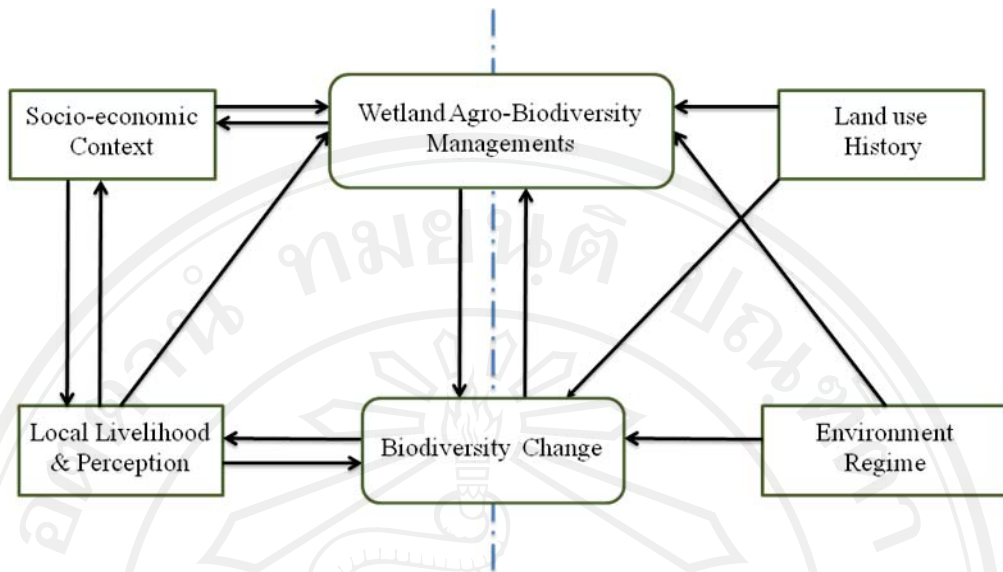


Figure 1-1: Framework for the analysis of biodiversity change, local communities, and wetlands area management. The arrows indicate the interactions of the factors.

### 1.8 Definition of terms

1. *Paa Bung Paa Thaam*: forest area that is flooded in 3-4 month/ year.
2. *Wetland agro-biodiversity products*: which are mentioned on this studied compose of the products from fishery, edible mushrooms, bamboo shoots, wild vegetable plants and earthworms.
3. *Direct use*: the commercial and non-commercial activities of community livelihood for cash and subsistence purpose.
4. *Surrogate market price*: the use of an actual market price of a related good or services to value the wetland use that is non-market.