

CHAPTER I

INTRODUCTION

1.1 Background

The Lao PDR, regardless of economic growth during the last decade, is still one of the poorest countries in Asia, with a gross domestic product (GDP) per capita of US\$ 490 in 2005. The total population of Lao PDR is 5.2 million people, where more than 85% inhabiting in rural areas, especially in the uplands. The poverty incidence remained high (38%) in 2003 (Sophathilath, 2006). The greatest levels of poverty are in the mountainous uplands of the Northern Region, where 50% of the land area has a slope of 30% or more. This mountainous Northern Region is extensively used for shifting cultivation (Raintree, 2002; ICEM, 2003; Vongpaphan, 2008). Most of farmers in this region practice shifting cultivation (*hai* system) to produce upland rice and/or other crops and also raise livestock. In addition, to compensate for rice shortages, they also generate income by selling non-timber forest product (NTFPs), wildlife, small livestock, vegetables and handicraft products, and hiring out family labour to wealthier farmers in their own or different villages.

In currently, shifting cultivation in Laos is largely based on the cyclical use of young secondary vegetation, although limited encroachment in older forest still take place in isolated areas. However, over the years, shifting cultivation has considerably reduced the forest area to the detriment of timber resources and natural habitats. Where shifting cultivation is intense, accelerated erosion and changes in the water discharge may impair water resources for irrigation, hydropower and domestic use.

For that reason, the uplands and upper watershed catchments of Lao PDR are of high interest to government policy-makers and most international agencies. These areas are at the interface where the incidence of poverty is highest and at the same time proper environmental management is most needed.

The government of Lao PDR (GoL) is determined to eradicate extreme poverty and move beyond the category of Least Developed Country by the year 2020. Therefore, the national socio-economic development plan of the GoL has outlined eight national priority programs, which are including (1) food production, (2) stabilization and reduction of shifting cultivation, (3) commercial production, (4) infrastructure development, (5) improved socio-economic management and foreign relations, (6) rural development, (7) human resources development, and (8) service development.

Because of these environmental and socio-economic problems in upland areas, the stabilization of shifting cultivation is a majority priority of the Lao Government. The GoL aims to transform the existing shifting cultivation to more ecologically stable cultivation systems with proper land management by villages and individuals.

This policy calls for the elimination of upland rice production in densely forested areas, diversification into perennial crops where possible and the development of more sustainable upland rice farming systems in those areas where rice production is essential (Linkham, 2007 and MAF, 1999). Consequently, the development strategies to stabilization of shifting cultivation are including land-use planning and land allocation, promotion of permanent cash cropping, expansion of livestock production, promotion of tree-planting by famers, infrastructure development and socio-economic development work.

However, the Ministry of Agriculture and Forestry (MAF) recognizes that for these policies to be implemented that appropriate in-situ alternatives must be available. In addition, the introduction of alternative requires a gradual process that builds on current practices, strengthens subsistence production, considers alternative livelihoods and does not threaten food security. In order to achieve these objectives, in 2002, the National Agriculture and Forestry Research Institute (NAFRI), under the MAF, established the Lao-Swedish Upland Agriculture and Forestry Research Programme (L-SUAFRP) based on the collaboration with the Swedish International Development Cooperation Agency (SIDA) organization. Therefore, the farming system research (FSR) component is a main research sector which aims to bring sustainable upland livelihood system through integrated participatory on-farm research which has research activities, transfer and dissemination new introduced technologies to farmers in upland areas of northern Laos, especially, the target area of the project in Luang Prabang and Oudomxay provinces.

Based on the findings on constraints of farming systems in the first phase of project implementation by using participatory problem diagnosis in target areas in 2002, two main problems were found to be 1) limited land for production and 2) insufficient food for consumption. As a result, a number of new technologies, collectively called 'Integrated Farming System', were presented to farmers as the choice baskets. Then, twelve technology options were selected and tested by farmers under their perspective and appropriate resources. Most of them categorized in 3 main systems, which they were included:

- 1). *Crop-animal farming system* (e.g. Goat + fodder bank, Duck in lowland rice, Fish in lowland rice, Cassava and pigeon pea for chickens and pigs);

- 2). *Integrated annual crop-based farming system* (e.g. Corn and legume contour cropping, Rice and legume crop rotation, IPM for off season cabbage using *Diadegma* and neem);
- 3). *Perennial crop-based intercropping system* (e.g. Fruit tree and annual crops, Agarwood + fruit tree and annual crops, Rubber + fruit tree and annual crops, Teak and annual crops).

In addition, based on rubber's market demand from China and Vietnam have several companies and there was a successful rubber production in Hadyao village, Luang Namtha province, where rubbers have already harvest latex and its yield price is higher than annual crop yield. For those reasons, they attracted upland farmers in Northern Laos to establish the rubber plantation. Therefore, farmers in the study areas were very interesting in the rubber plantation. Because it could be the stable land use practice as the government strategy needs and also could provide more income when rubber will be harvest. Then, L-SUAFRP brought rubber into a introduced technology for participated project farmers in study areas. Moreover, non participated project farmers were realized the benefit of rubber plantation, they invested and learnt for seedling production skill by them-self. Moreover, it currently has popularity in the mountainous area of northern Laos and there are a lot of supports from Chinese and Vietnam investors on rubber cultivation (Raintree, 2005).

1.2 Rationale

Calub (2005) asserted that poverty might be alleviated by farming production systems that contributes to securing food and providing income to rural families, and then, Manivong (2008) stated that, to stabilize shifting cultivation and eradicate poverty in Northern Laos, more sustainable and income-generating agricultural

practices have to be identified and adopted. One possible approach to support this transformation is the introduction of tree crops such as rubber to increase farmers' income. As the nature of limited-resource family farms that farming diversity is a necessity. The major production goal is to secure sufficient food supplies for their families, in other words, they pursue diverse food procurement strategies in order to first satisfy home needs, and then sell any surpluses (Thangata, Paul.H et al, 2002).

After first phase of project implementation in the integrated rubber-based farming system (IRFS), integrated rubber and fruit tree on hedgerow system with some annual crops along the space between contour lines, is an satisfied achievement alternative of solution for limited land and to decrease soil erosion that usually caused by *hai* system practice, and also it can provide more general income to landowners.

1.3 Objectives

Given the above background and previews, this study aims to:

1. characterize and assess strengths and weaknesses of *hai* system and IRFS
2. compare the benefits and costs of both two systems
3. identify problems and constraints to adoption of the new recommended practices (integrated rubber-based farming system)

1.4 Usefulness of study

This study will highlight the effect of the integrated rubber-based farming system, IRFS, which is the new recommended practice introduced by L-SUAFRP. This study will be useful information to researchers, extension workers and also other who interesting in agroforestry as rubber-based integrated farming system for their work. It will lead to better understanding of farmers' situation and eventually to the improvement of their welfare.