

## Chapter I

### Introduction

#### 1.1 General background

Before 1986 Lao PDR had a centrally planned economy with government ownership and control of productive enterprises. After the reform of the New Economic Mechanism (NEM) was introduced in 1986, the government has been transforming the economy from the centrally planned to a market-oriented system i.e., decentralizing control and encouraging private enterprise. The economical reforms and sound macroeconomic management initiated under the NEM brought about a steady improvement towards macroeconomic stability, production growth, the promotion of a small private sector, and foreign investment and trading.

However, agriculture remains a major sector of the Lao economy, contributing 53 percent of GDP and employing over 80 percent of the labor force, and continues to be important of Lao economy [URL1]. The total agricultural land in Lao PDR in 1998 was 788,162 ha of which 617,538 ha (78.4%) was paddy rice. This area included wet low land paddy rice (54.6%), dry season paddy rice (6.7%) and upland paddy rice (17%). The other crops were maize (5.9%), vegetables (3.9%) and woody perennial crops (9.1%) (MAF, 1999).

Sustainable rural development and natural resource management will require elaborating and/or correcting policy distortions, improving agricultural productivity, and ensuring appropriate forestry management techniques for environmental sustainability. In recent years, deforestation for food production is still one of the important issues that the Lao government is trying to solve. For protecting and preserving its natural resources the Lao government wants to replace shifting cultivation with permanent agriculture. Policy targets for land planted to upland rice

has decreased (64.7%) from 164,100 ha in 1977 to 58,000 ha in the year 2000 (Lao-IRRI Project, 1998). Reduction in the land area planted to upland rice requires growing various kind of fruit trees, and integrated farming instead of slash-and-burn cultivation, in which mango received the high priority among the fruit trees. Besides, the government also has a policy in promoting private sectors to invest in food processing of agricultural products (MAF, 1999).

The Luang Prabang provincial government has emphasized on food production by increasing the land area under cultivation; promotion of integrated farming systems to boost yields; construction of irrigation schemes for dry season rice cultivation; expansion and commercialization of fruit and vegetable production. The province also undertook to promote livestock where it was feasible and upland land allocation program to reduce and eventually eliminate shifting cultivation (Luang Prabang Provincial Brochure, 2000).

Mangoes are universally considered one of the finest fruits and are one of the most important fruit crops in tropical and subtropical areas of the world. In Lao PDR, mango is grown through out the country from the north to the south. It is also a widely adapted fruit tree in Luang Prabang province as in the rainfed upland conditions, where local cultivar, Kaew is most popularly grown. It plays an important role and becomes an important component of farming systems, because of its multi-utilization properties. Besides, growing for household consumption, mango has become an important part of annual income for farm households. Mango is an alternative for farmers to reduce the environmental risks, reduce the risk from crop loss, increase their livelihood diversification that will meet the government's policy in reducing deforestation caused by slash-and-burn cultivation, especially in Northern Region of Lao PDR in order to keep sustainability of forests, and environmental sound for the next generations.

In Luang Prabang province, mango is a favorable and popular fruit tree among the other perennial crops and fruit trees. If compared with coconut, banana, jackfruit and tamarind, mango occupies a high percentage than the others. There were 23,960 households (43%) of the total households of the province who engage in mango

cultivation, and occupies an area of 1,726 ha of which 661 ha of the areas accounted for compact plantation systems (National Statistic Center, 2000). Farmers have practiced this kind of fruit for a long time but the productivity and qualities are still low.

On the other hand, there is a main national road and number of large rivers flowing through the province facilitating regional trade and transport. Apart from this, the climate in the province is suitable to extend the maturity of mango until July that can create good opportunity for farmers to get a high price. All of these will be high potentials for Luang Prabang province to grow mango and distribute the fruits to the other northern provinces where there are less mango trees or will be a main source of raw materials for industry in the future.

## **1.2 Rational of the study**

Luang Prabang is predominantly mountainous province rich in natural resource endowments such as land, forests, rivers etc. In overview, the climatic and soil conditions are suitable for cultivation of various tropical crops, especially fruit trees in which including mango. In the past decade, extension work in fruit tree growing was not strongly promoted, most of farmers have practiced traditional method. Fruit trees were grown around their paddy fields, home gardens, schools and temples mixed with woody perennial trees. They grew fruit trees for their home consumption and some of them grew for sale.

Until now, there are only 1,726 hectares of mango areas in the whole province. As in the past and at the present, in growing mango farmers face the main problem of low quality and productivity. Low quality and low productivity are caused by poor management. Most farmers still conduct traditional practices (without pest control, fertilizer application and pruning after harvest) as well as lack of knowledge in plant propagation. Majority of farmers used to multiply mango by seedling, and extended for many generations. Multiplication of mango by seedling had many disadvantages such as the trees become taller, big shape that lead to difficulty in management, it took a long time for fruiting (5-6 years) and seed propagation does not ensure true-to-

type plant reproduction from monoembryonic mango. Lack of knowledge in vegetative propagation becomes a significant problem in mango production systems in the province.

Demand for consumption of population and amount of providing raw materials for agro-processing industry are increasing in each year especially Kaew mango. So one of the most important prospects and strategies of mango industry in the future of the province is improving the production systems through appropriate vegetative methods of propagation in order to increase productivity with a good quality, to meet the needs of domestic consumption, to reduce import mango from foreign countries and finally to be able to support enough amount of raw materials to processing industry.

There was a small number of farmers, who have practiced the vegetative methods of plant propagation. There were only few farmers, who produced grafted materials for commercialization. However the effect of these technologies have not been evaluated. The fate of these technologies is never determined and is taken for granted that these technologies address farmers' problems. So the important issue is the selection of appropriate vegetative methods of propagation to support farmers in order to improve the both quality and productivity of mango production systems in the future.

### **1.3 Objectives of the study**

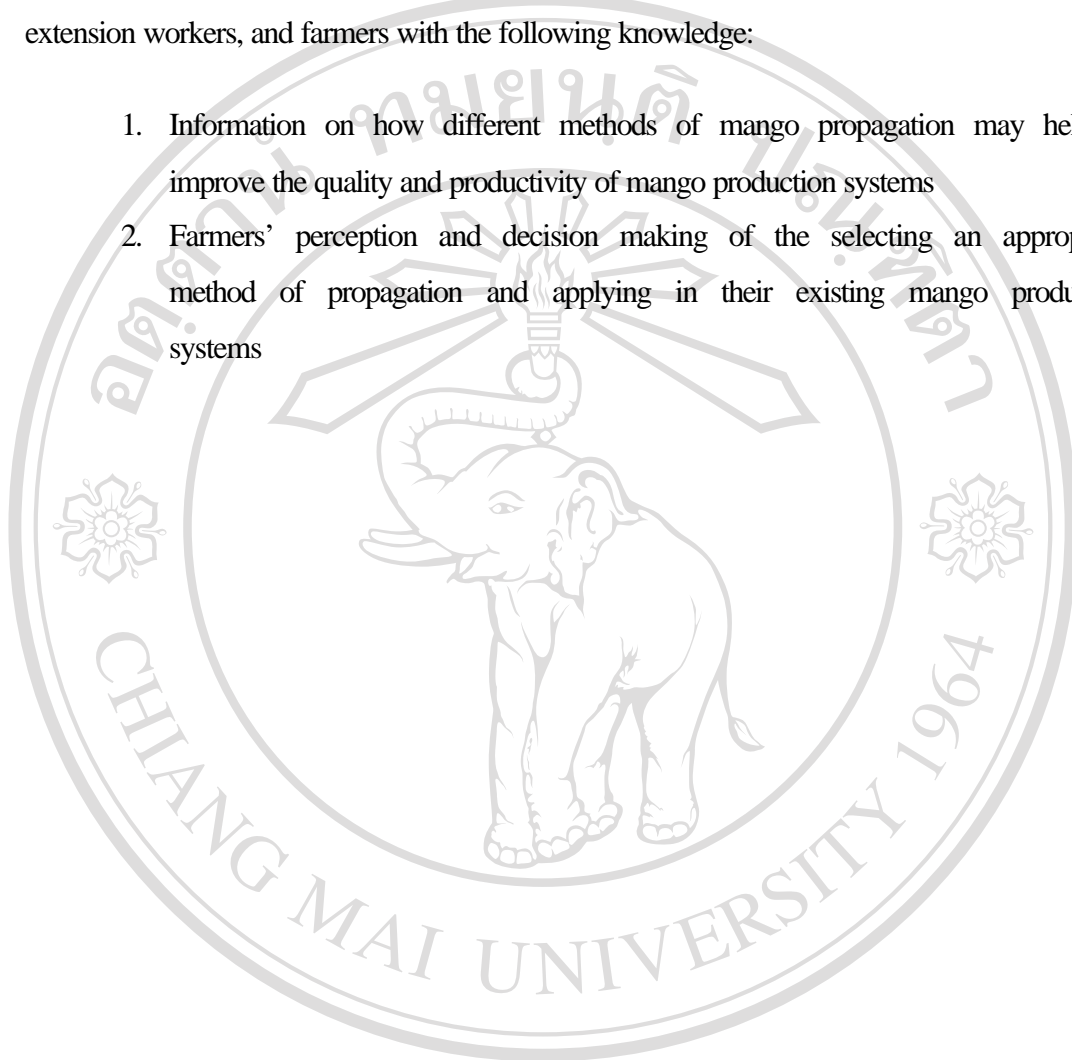
The objectives of this study include:

1. To examine the existing farmers' practices in mango propagation in Luang Prabang province
2. To evaluate the effects of different age seedling rootstocks and methods of grafting on survival and growth of the grafts
3. To assess the feasibility of grafting techniques for the farmers

#### 1.4 Usefulness of the study

The research finding will be useful in providing information to the researchers, extension workers, and farmers with the following knowledge:

1. Information on how different methods of mango propagation may help to improve the quality and productivity of mango production systems
2. Farmers' perception and decision making of the selecting an appropriate method of propagation and applying in their existing mango production systems



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