

Chapter I

Introduction

The Lao People's Democratic Republic (Laos) is located between 14° 10' and 22° 10' N latitude, and 100° 20' to 107° 50' E longitude (Figure 1). It has an area of 236,800 km², and is inhabited by more than five million people, comprising 47 ethnic subgroups (Lao-IRRI, 2002). Laos has a tropical monsoon climate, with a pronounced rainy season from May through to October. Monsoons normally occur at the same time across the country, although that time may vary significantly from year-to-year. Rainfall also varies regionally. Most of the rainfall is received in the period from May to October when most farmers grow a single wet-season rice crop. A cool dry season starts from November through February and a hot dry season in March and April.

Administratively, the country is divided into three distinct agricultural regions: the northern, central and southern regions (Figure 1). Each of these regions generally has unique climate, topographical and soils characteristics. The mean annual rainfall for each region is approximately 1,450 mm in the northern region, and 1,800 and 2,100 mm in the central and southern regions, respectively. Mean maximum and minimum temperatures in the central and southern regions are 32° C and 24° C, and 29° C and 20° C in the northern region. Elevation ranges from 150 m above mean sea level in the major rice-growing plains along the Mekong River Valley, to 2,818 m in the mountainous central and northern regions.

Rice is the only crop contributing to agricultural sector in Laos (Lao-IRRI, 2002). Planted area to rice is estimated over 600,000 ha and, accounting for about 80% of the planted area (Ministry of Agriculture and Forestry, 2001). Approximately 82 % of production comes from the rainfed environments, both lowland and upland growing area. Rainfed lowland rice occupies the largest area in order of 66% of the total area in the country.

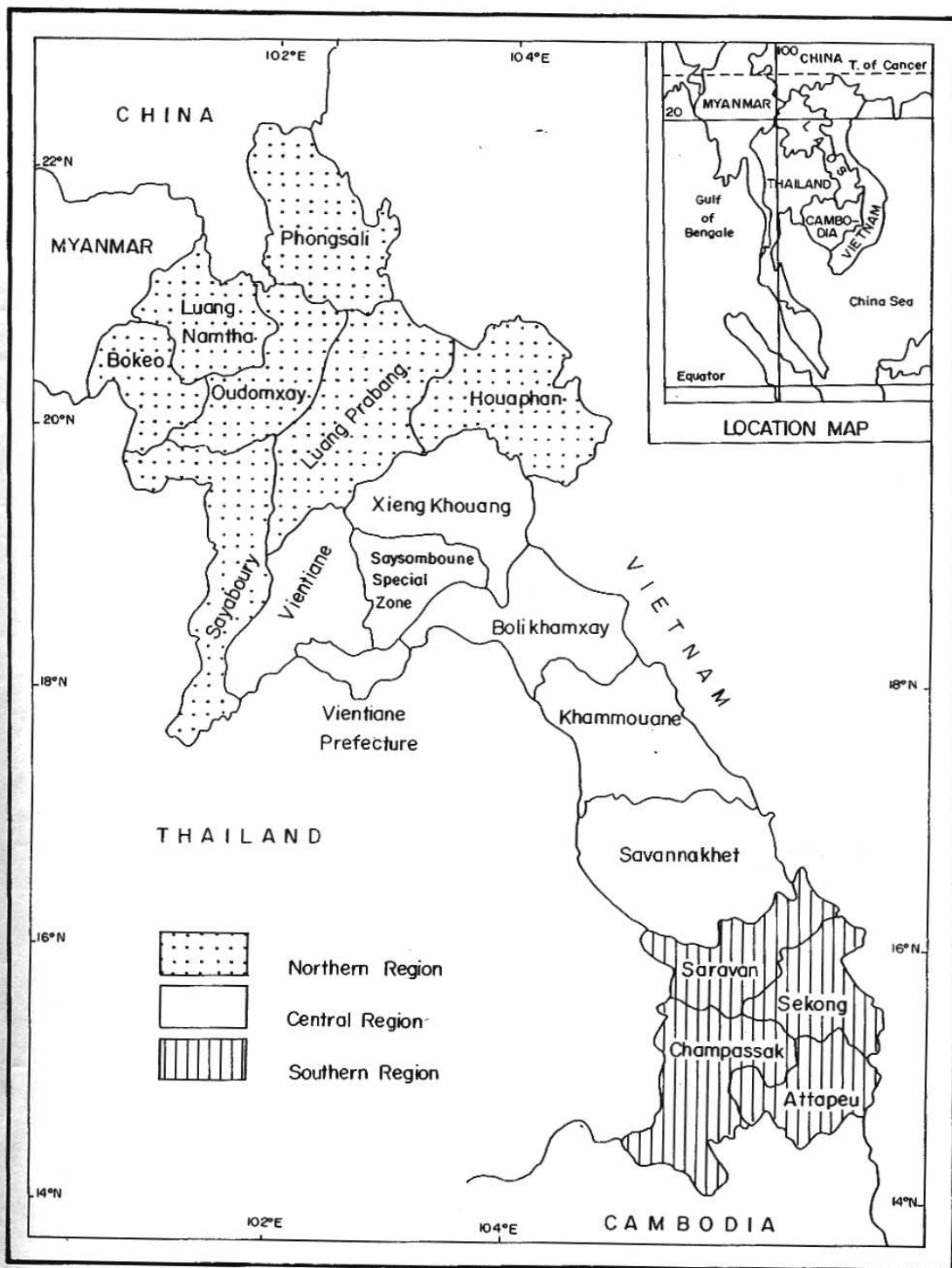


Figure 1. Location of regions and provinces in Lao PDR

Despite the significance of rice in the country, a systematic program of rice variety improvement has just commenced in 1991 with Swiss government support through the International Rice Research Institute (IRRI) (Lao- IRRI, 2002). The program started off with initial emphasis on the development of improved varieties, but mainly for lowland rice growing areas of provinces along the Mekong River. The first improved varieties, example, Thadockham 1 (TDK1), Thadockham 2 (TDK2) developed in this program were released in 1993 and 1994; these early varieties were derived from crosses of Thai-IRRI lines and they were glutinous and non photoperiod sensitive. Further new varieties like: Thadockham 3 (TDK3) and Salakham12 (SK12) have been systematically released throughout the latter part of the 1990s (Lao-IRRI 2001). All of the more recent varieties have also been glutinous types and have been based on selection from crosses of IRRI, Thai-IRRI, and Vietnamese lines. By 1999, most of traditional rice varieties grown provinces along the Mekong Valley were replaced by many improved varieties. In these provinces, at least 70% of the area was estimated under the improved varieties, at the same time, the less in compared with less than 5% being sown to improved varieties in 1991. Genetic diversity of both glutinous and non-glutinous rice in both the rainfed lowland and rainfed upland environments was very great throughout the country (Appa Rao, 1997).

Despite attempts to promote the improved varieties, farmers in some of the village are reluctant to adopt improved varieties. In the north of the country, including Houaphanh province, the rate of adoption of improved variety is very low. A major difference between the rice growing environment of the northern provinces and that of the major rice growing area in the Mekong River Valley, are lower temperatures in the northern provinces, particularly in the latter part of the growing season (Schiller et al. 2001). In the 1999 production year, traditional varieties are still accounted for about 94% of the cultivated rice area in Houaphanh province (Central Agricultural Statistical Office, 2000).

Houaphanh province is located in the northeast of the Lao PDR; mountainous terrain covers more than 70% of the province. The province is divided into eight districts and has a total population of over 200,000. The total area of rice production in the province in 2000 was approximately 26,700 ha, of which 53% was rainfed

upland rice and 43% rainfed lowland rice. Less than 1,000 ha were under irrigated production (dry season). The province accounts for about 5% of national rice production (Ministry of Agriculture and Forestry, 2001).

The focus village in this thesis were Ban Kan, Ban Ong, and Ban Lak Sipsong in the district of Samneua in Houaphanh province of northern Laos (Figure 2). These villages represent the range of ecosystems for rice production in the area. Traditional rice varieties still dominate in the upland and lowland environments. For the lowland environment, a few varieties are being grown, especially the most popular variety of *Kainoyleuang* (KNL). This variety has been grown for over 20 years. In the upland environment, reduction of cultivated area resulted from government policy changes in agricultural production by reducing of cultivated upland crop areas in particular upland rice area. The key question is how do farmers manage their upland rice varietal diversity in the face of policy change? What are the major reasons why farmers maintain traditional varieties in the village? Samneua district is the central district for the province the provincial town of Samneua located. The district comprises a total 136 villages, of which 62 grow mainly rainfed lowland rice, 15 grow almost exclusively rainfed upland rice, and 59 grow a combination of rainfed upland and lowland rainfed rice (Agriculture and Forestry Office, 2001).

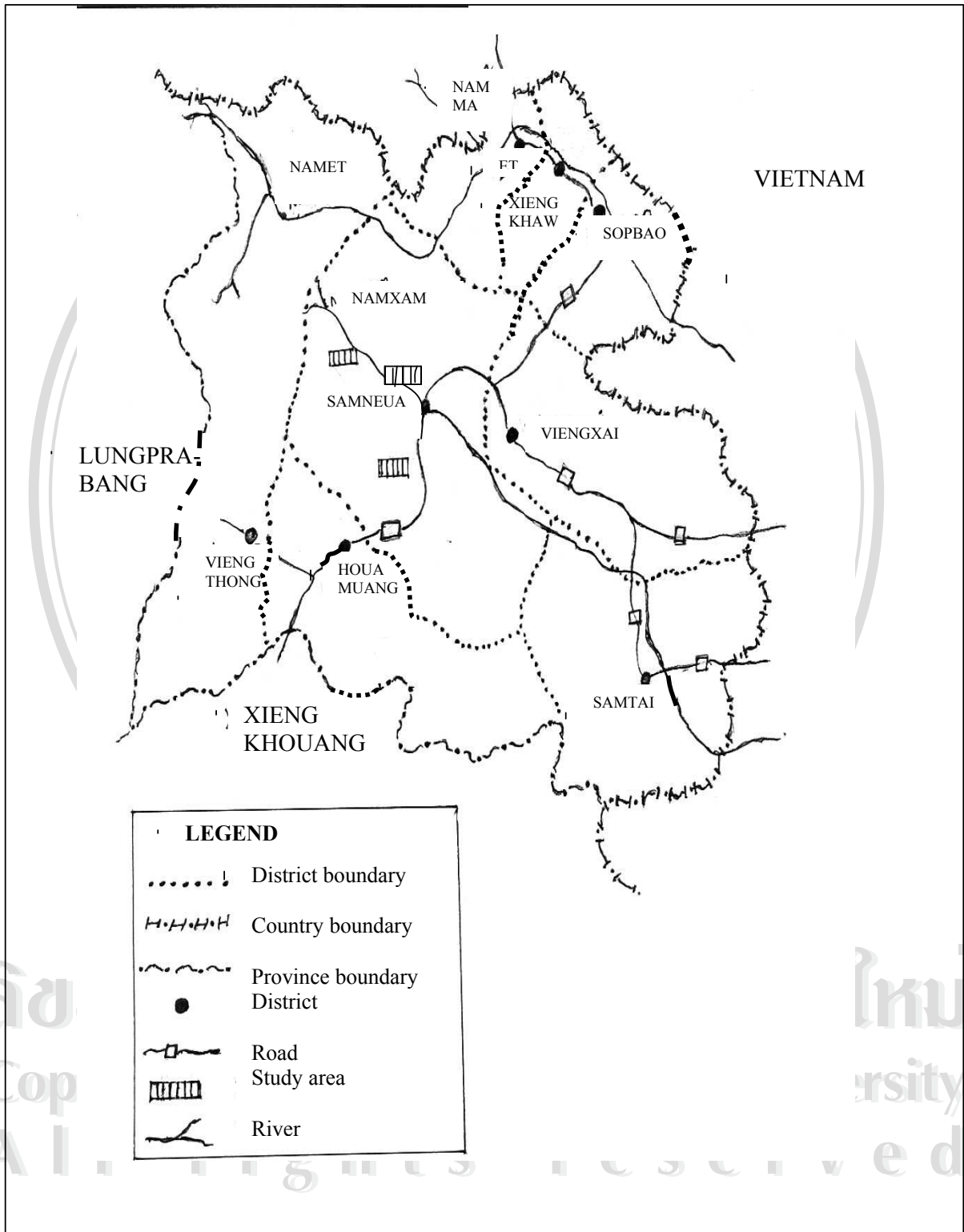


Figure 2 Location and district composition of Houaphanh province

The overall objectives this thesis was to evaluate diversity of local rice germplasm and examine farmers' use and management of local rice varieties including the level of productivity achieved. More specifically, the objective study was aiming to:

1. Determine the range of local rice germplasm grown in the study area, and to identify the varieties, and attributes of these varieties considered important by farmers,
2. Document farmers' management practices for traditional varieties, including the management of seed plots, selection processes, storage and exchange of seed among farmers,
3. Measure the diversity within, and between the common varieties in the study area, and
4. Examine the yield range of the popular traditional lowland rice variety of *Kainoyleuang* (KNL), and to measure diversity within this variety within and between farmers' fields.