

## CHAPTER III

### NATURAL AND SOCIO-ECONOMIC ENVIRONMENTS

Chom Thong land reform area is similar to most of the other land reform areas in that it is located in the encroached forest and it is a land which is generally less fertile and lacks a water supply. Members of the LRA project were either locals who initially-illegally occupied the area and migrants.

The physical or natural environment as well as the socio-economic characteristics of the members are normally hypothesized to have an impact on farmers' decision about production system i.e. utilization of resources, cropping patterns and off-farm employment. This chapter describes the natural and socio-economic profiles of the area and the farmers so as to provide background information for further analysis in the latter chapters.

#### 3.1 The Project Area and its Location:

The Chom Thong forest land reform project is located 39 k.m. South-West of Chiang Mai city (Figure 3.1) at the latitudes of  $18^{\circ} 28'N - 18^{\circ} 35'N$  and at the longitudes of  $98^{\circ} 44'E - 98^{\circ} 50'E$ . It covers an area of 16,317 rai of which 11,584 rai have been allocated to the project members in plots of an average of five rai/household (Chiang Mai PLRO, 1989). The project area covers two sub-districts namely Yang Khram and Doi Lor. The 14 villages included in the Chom Thong land reform project are:

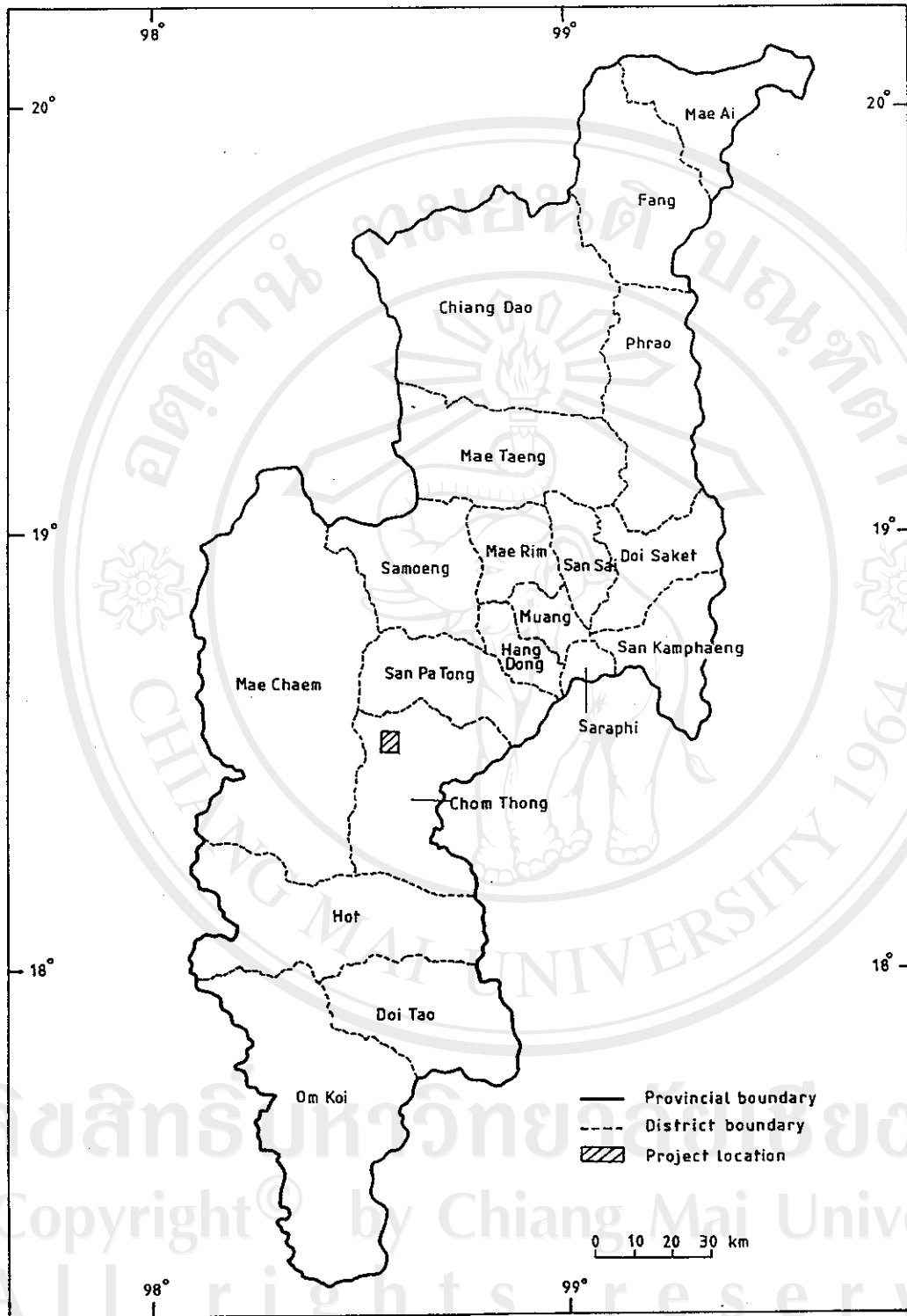


Figure 3.1 Chiang Mai Province and Chom Thong Land Reform Project location.

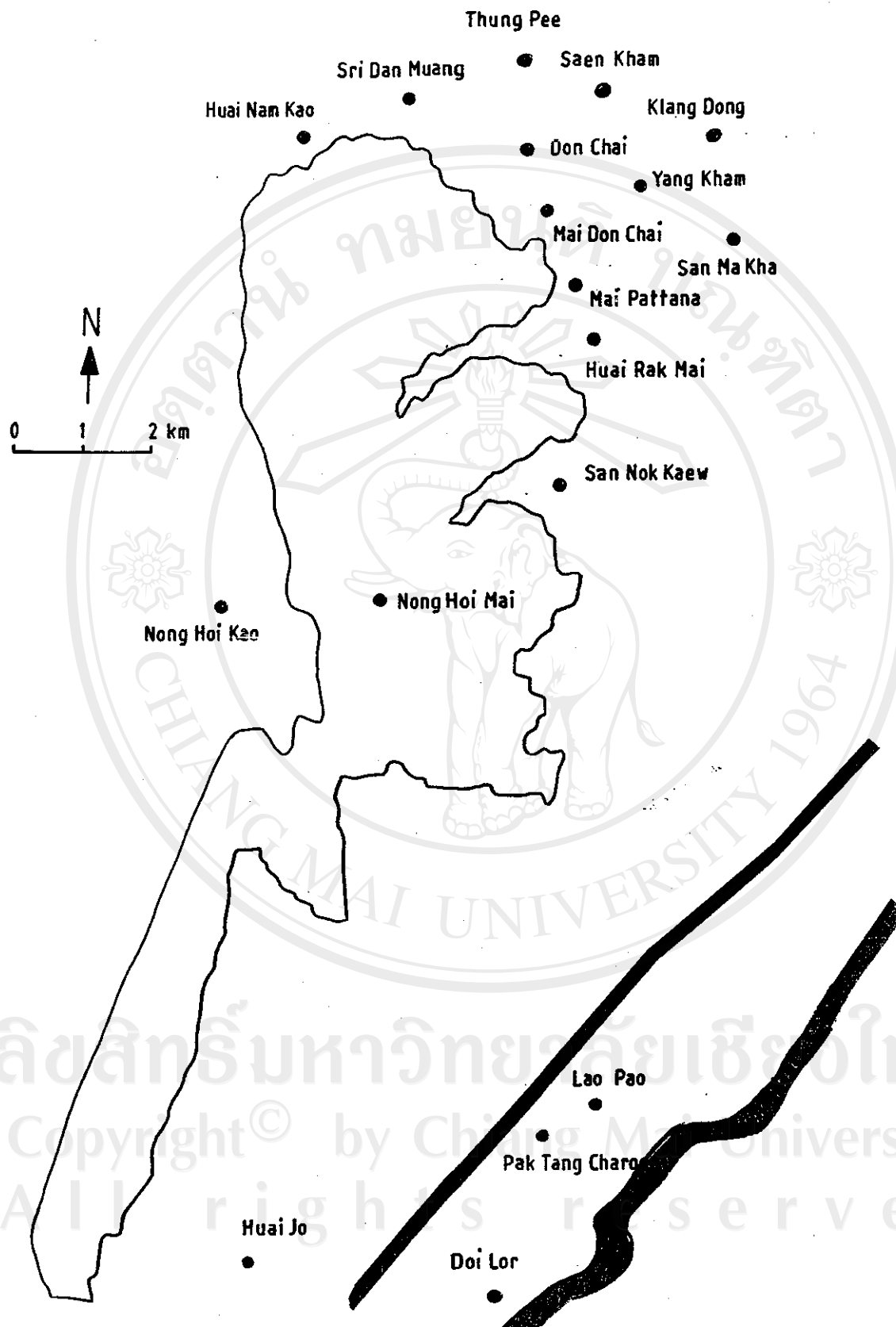


Figure 3.2 Villages location.

B. Nong Hiang, B. Huay Rark Mai, B. Don Chai, B. Sri Dan Muang, B. Huay Nam Kao, B. San Nok Kaew, B. Nong Hoi, B. Mai Pattana and B. Mai Don Chai are governed under sub-district of Yang Khram.

B. Lao Pao, B. Pak Tang Charoen, B. Huai Jo, B. Doi Lor and B. Dong Pa Wai are governed under the sub-district of Doi Lor.

### 3.2 Physical Environment Characteristics

#### 3.2.1 Topography

The Chom Thong LRA is in an undulating to rolling phase at 300-360 meter amsl. with the slopes varying from 0-35%. Based on the land suitability characteristics, the project area can be divided into three parts i.e. the northern, middle and southern parts.

The northern part is an undulating area at 331-335 meter amsl. Its minor area at 311-325 meter amsl. lies on the east side of the area. It was also found that in the center of the northern part there is a range in the area of 336-340 meter amsl. with 2-4.9% of slopes creating two watersheds lying on the east and the west of the area. This part is mainly an N-III class of land suitability (defined in the next section).

The middle part of the project area slopes eastward by 0-4.9% with a land elevation of 311-335 meter amsl. The area with an elevation above 335 meter lies in a north-south direction on the west side of this part of the area. An N-IV class of land suitability is the dominant type in this area.

The southern part looks like a mountain range lying 45° SW. Its topography is in an undulating to rolling phase with a wide range of land elevation 300-360 meter amsl. Areas with an altitude above 350 meter and more than 8 % of slope lie along the west of the boundary. This part of the land has severe erosion and leaching due to steep slopes and has become the least productive area. The rest of the southern part of the project which lies above and under those severe unproductive areas are equally occupied by the N-III and N-IV classes of land suitability.

### 3.2.2 Soil Characteristics and Land Suitability

The project area was a deteriorated forest which was encroached for upland crops purposes. Thasananukulkit (1980) reported that the major soil characteristics of the area were sandy loam to sandy clay loam with a pH of 6.5-7.5 which covered about 57% of the project area. Some limitations found in those soils were:

- a) shallow soil surface;
- b) low soil fertility which could be reclaimed by applying organic matter together with appropriate chemical fertilizers; and
- c) lack of moisture which required the water supplements.

Land suitability of the Chom Thong LRA is classified into two main types, namely, land suitability for upland crops and for orchards or fruit trees.

### 3.2.2.1 Land Suitability for Upland Crops

The suitability classes for upland crops as shown in Figure 3.3 can be divided into four groups.

- 1) The N-II group is well suited for upland crops and it occupies about 0.5% of the project area.
- 2) The N-III group occupying the major area (about 57% of the total LRA) represents a moderate suitability of land for upland crops. This class requires some management to tackle their limitations.
- 3) The N-IV group covers 38% of the total LRA. It shows that land is marginally suitable for upland crops due to the gravel surface and the undulation and slope of the land (1-9%). Intensive management to improve soil texture and to protect soil erosion is needed in the N-IV group.
- 4) The N-V group is not suitable for upland crops at all because of the shallow - gravel soil surface and steep slope (4-40%). This group covers 4.5% of the total LRA.

### 3.2.2.2 Land Suitability for Orchards

Figure 3.4 shows that there are nine classes of suitability for orchards. These can be lumped into four groups.

- 1) The O-I group is very well suited for orchards. This class of land covers only 0.5% of the total LRA.



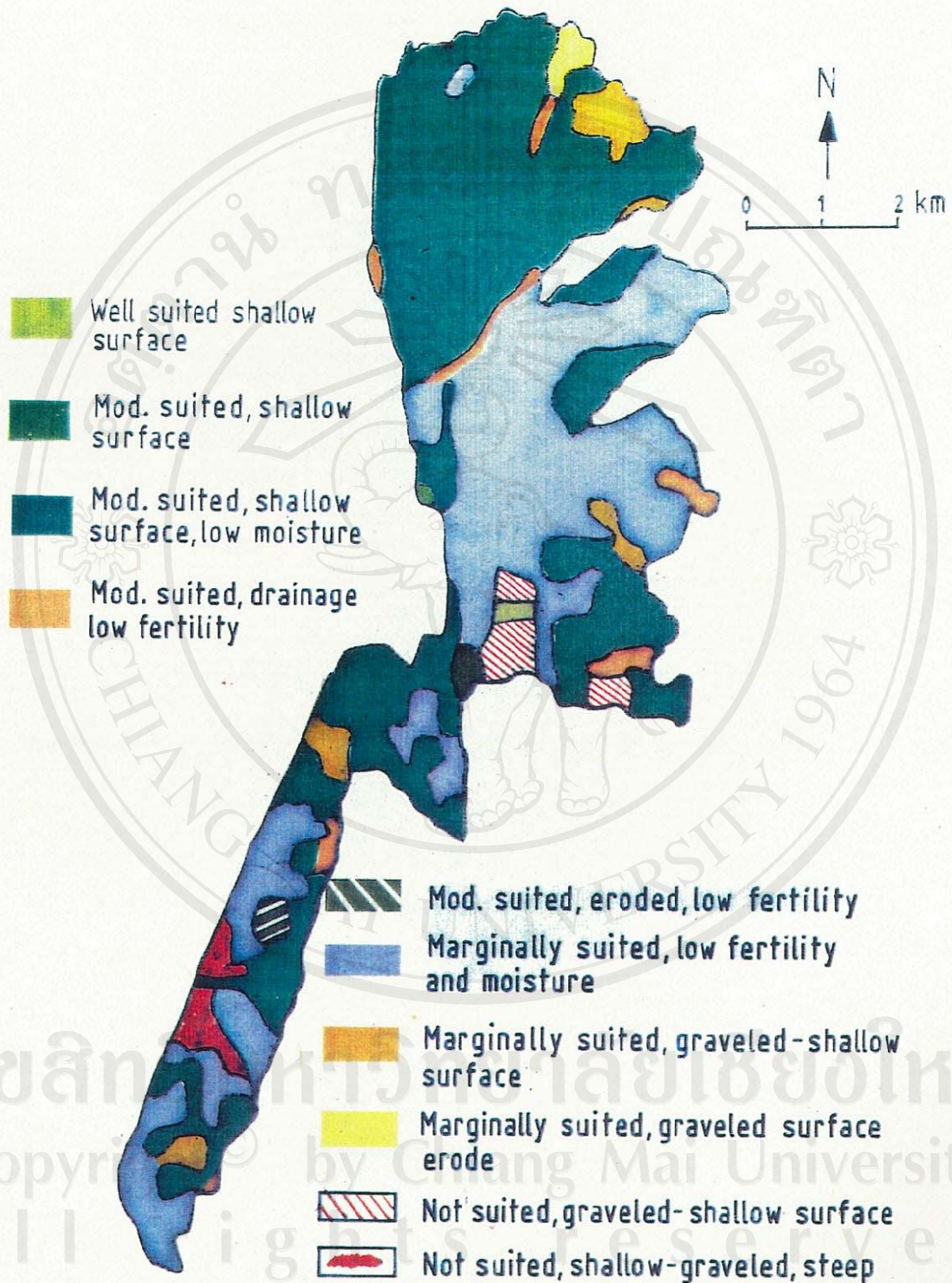


Figure 3.3 Land suitability for field crops of Chom Thong LRA.



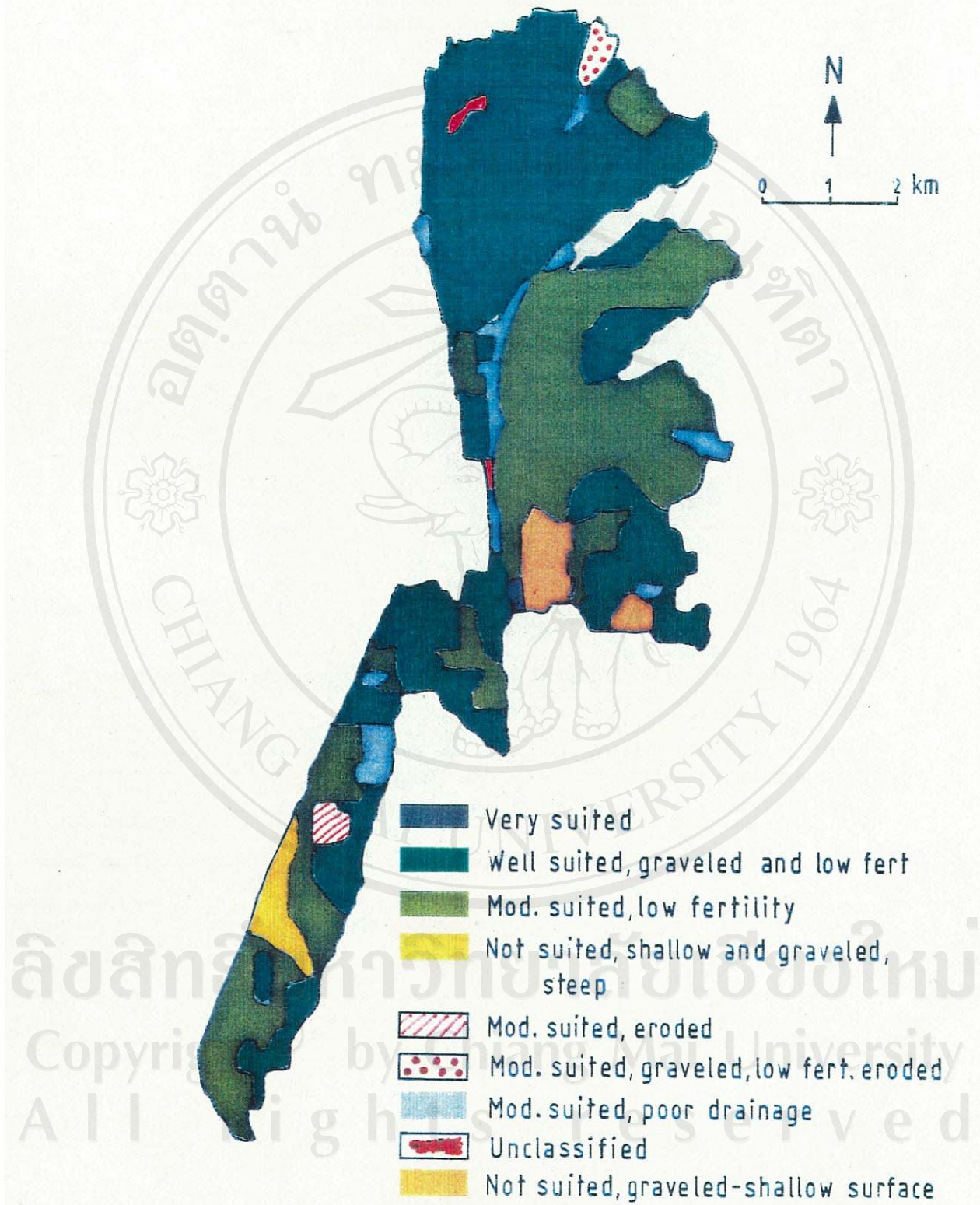


Figure 3.4 Land suitability for orchards of Chom Thong LRA.



- 2) The O-II group is well suited for orchards covering a major part of the total LRA about 53.5%. This class of land is somewhat well-drained with 1-7% of slope, so it requires soil texture and soil fertility improvement.
- 3) The O-III group occupies about 41% of the total LRA. The land is moderately suited for fruit trees due to inappropriate soil texture and low soil fertility in some parts of the area. Soil erosion and highly well-drained soil are the problems.
- 4) The O-V group is not suited for orchards because of the shallow and gravel soil surface and the severe soil erosion. This land class is in an undulating to rolling phase with 4-40% of slope. About 5% of total LRA is found to be of this type.

Comparing Figure 3.3 and Figure 3.4 one can roughly conclude that the Chom Thong LRA is more suitable for orchards than for annual crops.

### 3.2.3 Rainfall and Temperature

The Chom Thong project area is a rain-shadowed area. During 1986 to 1989 the average annual rainfall was about 856 m.m. with the average rainy days of 83 days per annum. The heaviest rain was found to occur in August while the lightest occurred in January. The maximum temperature varied from 27°C to 47°C and the minimum temperature varied from 7°C to 25°C.

### 3.3 Socio-economic Profile

#### 3.3.1 Chom Thong Land Reform Farm Members

From 303 farmer samples, 57% of the total households were native people of these 14 villages (mentioned in 3.1), and the rest were migrants from the nearby districts. Most of the sample households (79%) were from the villages of Yang Khram sub-district (Table 3.1). The rest were the residents of Doi Lor sub-district in Chom Thong district and of Thung Pee and Ban Klang sub-districts in San Pa Tong district. The Yang Khram, Thung Pee and Ban Klang farmers' plots were found in the northern and middle parts while the Doi Lor farmers' plots were in the southern part of the project area.

The Chom Thong LR farm households can be divided into two groups according to land holding:

(1) Group 1 are the LR farm households which held only the land within LRA.

(2) Group 2 are the LR farm households which held lands both inside and outside the LRA.

About 64 percent of the sample farmers had land only in LRA (group 1) and 36 percent had land both inside and outside LRA (group 2). Most of group 1 farmers were in Yang Khram, Thung Pee and Ban Klang. Their land locates in the north of the LRA. It is more suitable for orchards. Doi Lor farmers whose land is located

in the south where land suitability is similar to the north but some parts are not suited for any plants.

**Table 3.1** Land reform farm members and their Residences.

LR Farms	Yang Khram HH	Doi Lor HH	Thung Pee HH	Ban Klang HH	All HH
Group 1	163	20	10	1	194 (64.03%)
Group 2	77	12	18	2	109 (35.97%)
Total	240 (79.21%)	32 (10.56%)	28 (9.24%)	3 (0.99%)	303 (100%)

### 3.3.2 Family Profiles

Among the LR farm households, the family size was 3.92 persons. Most members or about 76% of the total family members were at the working age (14-60 years). On the average, the sizes of family and working members of group 1 and group 2 were about the same (Table 3.2).

Table 3.2 Family profile of LR farms.

LR Farms	Persons per HH		Age						
			1-13		14-60		>60		
	Total	M	F	M	F	M	F	M	F
			%	%	%	%	%	%	%
Group 1	3.87	2.07	1.80	8.53	6.98	40.57	35.92	4.39	3.62
Group 2	4.00	2.01	1.99	4.25	8.50	40.0	36.75	6.0	4.5
Total	3.92	2.05	1.87	7.14	7.40	40.31	36.22	4.85	1.08

### 3.3.3. Household Labor

Labor is one of the most important resources in agriculture since the farmers in LRA are rather poor and the production technology is very labor intensive. Most households in the area are, quite small, including parents and children. Thus, in this research household and family are interchangeable. Household labor was measured in terms of the working labor and farm labor. Working labor refers to the number of family members aged 14 to 60 years old. Farm labor refers to the number of the active laborers who were on farm full time. The average size of working labor groups in the Chom Thong LRA were 3 persons or about 76% of the total household members. In 1989, the farm labor accounting for 98% of the total working labor, were available on the farm while the rest (or 2% of the working labor) were absent for off-farm employment. The proportion of dependents to working labor equalled 1:3. This



meant that the burden of the Chom Thong LR farmers was not critical. Dependents refers to family members who were disabled, and those aged from 1 to 13 and over 60 years old. In comparisons of the two groups, both of them had about the same sizes of active labor and dependents, but the size of absent labor was slightly different. The higher percentage of absent labors for off-farm jobs appeared in group 2 (Table 3.3).

**Table 3.3** Labor availability and distribution.

LR farms	Household members	Working labor .....persons.....	Farm labor	Absent labor	Dependents	Available farm labor (mandays)	
						in season (a)	off-season (b)
Group 1 (n=174)	3.87	2.96	2.92	0.04	0.91	266.44	73.6
Group 2 (n=109)	4.00	3.07	2.97	0.11	0.93	276.3	491.2
Total (n=303)	3.92	3.00	2.93	0.07	0.92	270.0	480.0

Note : (a) = working labor x 90 days  
(b) = working labor x 160 days

And to look at the overall picture, the Chom Thong LR farmers spent 115 days for religious activities, leisure, social activities etc. Thus only 250 working days were shared for on farm and off-farm activities. Within these 250 days, 90 days during August to October were considered as the peak season period while another 160 days during November to July were working days in non peak season.

### 3.3.4 Land and Farm Sizes

LR farmers occupied on the average 5.53 rai of farm land inside the LRA. Group 1 farmers held slightly larger farm land areas in the LRA than group 2. The farmers of the latter group were in a considerably better and more advantageous status than the former group because of possessing land outside the LRA. The average farm size of the farm lands outside the LRA was 4.21 rai/household which resulted in the farm size of group 2 being 9.46 rai/household on the average.

**Table 3.4** Average farm size of LR farmers.

LR farms	Inside LRA	Outside LRA	rai Both areas
Group 1 (n=194)	5.68	-	5.68
Group 2 (n=109)	5.25	4.21	9.46
Total (n=303)	5.53	1.51	7.04

### 3.3.5 Land Utilization

Most of the farmers used their land for soybean, tobacco and mango production (which accounted for 76% of the total observed farm area) (Table 3.5). The rest of the area was utilized for peanut, mungbean, rice, tomato, roselle, longan and other crop production. In 1989/1990 the Chom Thong farm area which was used for year round cultivation accounted for 1649.89 rai or 98.53 % of

the total in the observed farm area. This land use intensity was rather high considering its fertility and suitability.

**Table 3.5** Land utilization in LRA in 1989/1990.

Items	% of total farm area	Planted Area (rai)
Soybean	31.13	438.05
Tobacco	30.38	427.50
Peanut	7.71	108.51
Mungbean	2.70	38.01
Rice	3.03	42.70
Tomato	4.59	64.64
Roselle	2.99	42.03
Mango	29.40	413.77
Longan	3.06	43.03
Others	2.25	31.65
<b>Total</b>	<b>98.53</b>	<b>1469.89</b>
<b>Intensity</b>		<b>0.98</b>

Remarks : 1) Total farm area = 1674.50 rai

2) Crop intensity =  $\frac{\text{planted area}}{\text{total farm area}}$

According to land use intensity, the LR farmers can be classified into 2 groups (Table 3.6).

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**Table 3.6** Degree of land utilization in Chom Thong LRA in 1989/1990.

Degree	Purposes	% of total farmers	% of total farm area
Fully utilized	- Crop only	30.69	31.76
	- Crop intercropped orchard	9.90	11.86
	- Crop and orchard	8.91	13.72
	- Orchard only	1.98	1.79
Subtotal 1		51.49	59.13
Partially utilized	- Crop only	29.37	15.08
	- Crop intercropped orchard	7.59	5.38
	- Crop and orchard	6.27	3.79
	- Orchard only	0.99	0.66
	- Uncultivated	-	12.08
Subtotal 2		44.22	36.99
Total not utilized		4.29	3.88
Total		100	100

Remarks : 1) Total observed farm area = 1674.50 rai

2) Total farmers = 303 households

3) Crop refers to annual crop

1) Those fully utilizing the land refers to the farmers who fully utilized their land for farm activities. There were 51.49% of the total farmers in this group who occupied 59.13% of the total farm area for the purposes of annual crops only, crop integrated or mixed with orchard and orchard only.



2) Those partially utilizing the land refers to those utilizing part of the area for farm activities. This type of farmer accounted for 44.22% of the total number of the farmers. From 36.99% of the land owned by this group 12.08% were left unused.

About 4% of the total LR farmers actually did not cultivate their land in 1989/1990. This again left 3.88% of the LR unused. Therefore, the unutilized land totalled 16.96% of the sample area.

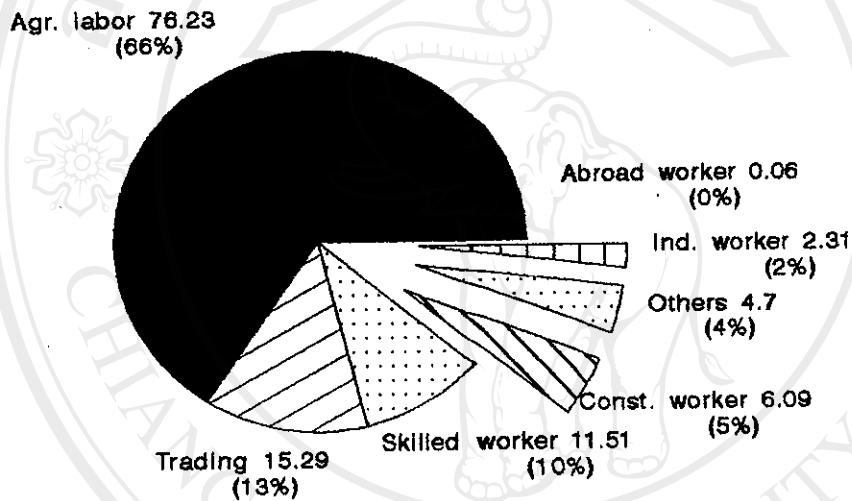
### 3.3.6 Capital

"Capital" refers to the investment on variable material inputs, hired labor and hired machine for land preparation. The expenditure includes that for materials (i.e. seeds, fertilizers, pesticides, and others); for labor (i.e. hired labor cost); and for machinery service (i.e. land preparation cost). The sources of capital for farming were mainly from savings. However, about 20% (62 respondents) of the farmers obtained credit from the Bank for Agriculture and Agricultural Cooperatives (BAAC), cooperatives, merchants and relatives.

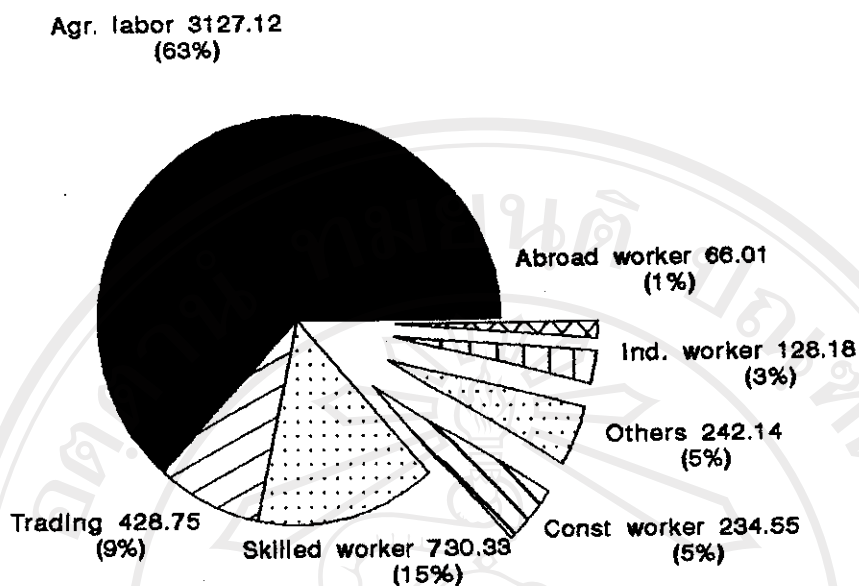
### 3.3.7 Occupations

Most of the Chom Thong LR farmers engaged in farming. Other main occupations were wage earning, skilled labor and small business. The farming activities covered some types of crops and fruit trees. The activities of wage earning included farm labor as the major activity, industrial work, construction work and etc. Skilled workers were barbers, carpenters, dress makers, weavers,

handicraft workers and etc. Small business such as mini-store and hog butchers were supplementary source of earning for some households. The distribution of labor to various activities is illustrated in Figures 3.5 and 3.6.



**Figure 3.5** Total labor share among Off-farm activities of LR farmers (mandays).



**Figure 3.6** Total net cash share among off-farm activities of LR farmers (baht).

On the average, household members work off-farm rather evenly throughout the year. The Chom Thong farmers spent an average of 116.19 mandays/household throughout the year for all types of the off-farm occupations. A greater portion was spent for agricultural labor which provided 70 baht/manday. The average off-farm income was 4957.85 baht/household (see Figures 3.5 and 3.6). It was also found that the farmers spent their times on off-farm jobs whenever they had free time.