

Chapter 2

Socio-economic components of the study area

2.1 General description of study area

2.1.1 Physical characteristics

Mae Taeng district, is located in the upper north of the Ping river basin, otherwise known as "Chiang Mai valley" (including Chiang Mai and Lamphun provinces), at an altitude of 340-350 meters above sea level. It lies between latitude $19^{\circ} 06' 1''$ N to $19^{\circ} 11' 0''$ North and longitude $98^{\circ} 56' ''$ E to $99^{\circ} 02' ''$ East, and is situated about 50 kilometers north of the provincial city of Chiang Mai. The district covers an area of 136,278 hectares, of which 9 percent, or 13,740 hectares, can be used for agriculture. The remaining 122,538 hectares are mixed evergreen-deciduous forest area and scrub mountainous hills (Figure 2).

The rainy season occurs from June to October, with an average rainfall per year of 1,205 mm, while the driest period is between January and March. Normally the temperature all year is rather warm, with daily temperatures ranging from 22° C to 40° C. Night-time temperatures during the brief cool season can drop to 8° C. The soil is mixed

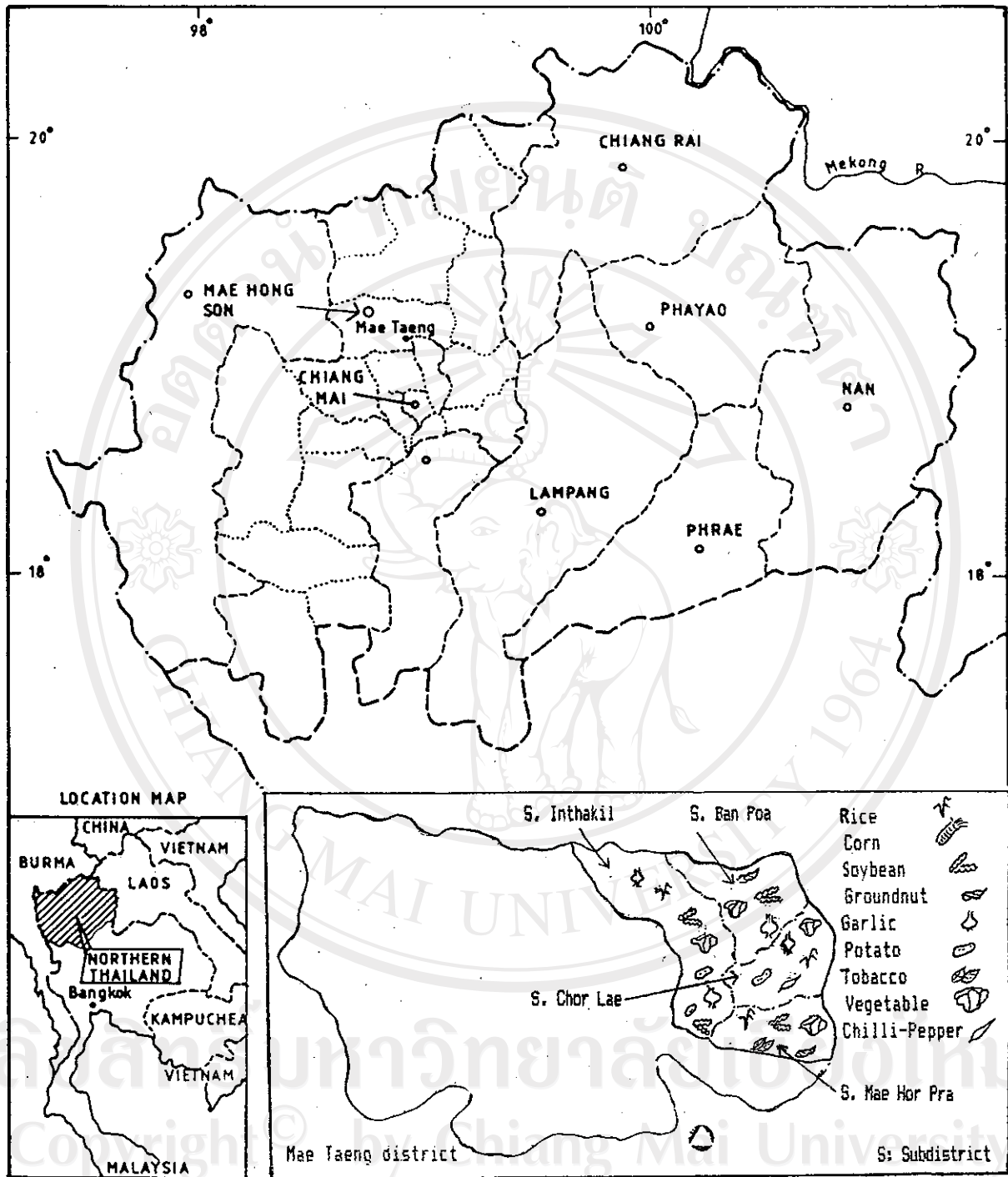


Figure 2. Map of study area in Mae Taeng district, Chiang Mai, Thailand.

with many soil types, such as the Hang Dong series, Mae Sai series, Korat series, and Alluvial Complete (AC). The Hang Dong/AC series are the dominant soil series in this area. They are deep soils, characterized by clay mixed with sand, with moderate drainage and fertility. Soil fertility is considered adequate for agriculture.

The study area has a slightly undulating topography, and is situated in the northernmost tip of the Ping river basin. The area is well-irrigated from both the Mae Ngad Irrigation Project and the Mae Ping Traditional Irrigation System, which has encouraged farmers to grow crops all year round. It has the potential to be one of the more fully intensive agricultural areas of Chiang Mai province. The continuous four subdistricts of the study site belong to the "Cho Lae Basin", for which there is some historical evidence that the area was once a small wealthy community, serving as a junction for trade and transportation along the Ping river to the north of and independent of Chiang Mai city. These four subdistricts occupy almost 42 percent of Mae Taeng's arable land area (5,776 of 13,740 hectares), and receive full irrigation supplies.

2.1.2 Economic and social characteristics

Mae Taeng is administratively divided into 13 subdistricts and 98 villages. The population is 69,002 persons, comprising 17,866 households, with an average household size of 4.99 persons, and a population density of 50.63 persons per square kilometer. The Mae Taeng labor pool mostly consists of those considered in their prime and is fairly equally distributed between males and females (1.00 : 0.89) (Mae Taeng Administrative Office, 1990). 74 percent of the district households live primarily by agriculture, with an average landholding size of 1.05 hectares. Members of the remaining households work in wage labor with small local industries in producing canned food, handicrafts, business and holiday resort places, or gathering forest products for sale. Since the transportation between villages is generally good, and the distance from the district to Chiang Mai city is not so far, many cases of daily wage labor in construction can be seen.

In 1988 the irrigated agriculture area had a land utilisation rate of 90 percent in the rainy season and 85 percent in the dry season, while the rain-fed agriculture area had a similar use of 87 percent and 82 percent respectively. This high number is the result of farmers who

started to build shallow wells in their rain-fed land about four years ago. The main crop during rainy season is rice which farmers grow in their larger plots mainly for home consumption while selling any excess paddy. In addition, farmers divide and use smaller-sized plots when they are not planting rice to plant crops such as mungbean, baby corn, tobacco, tomato, cucumber, or other vegetables for cash. After harvesting their rice, the farmers select a variety of crops for the cool and dry season among soybean, chilli pepper, onion, garlic, tobacco or other vegetables depending on the availability of cash or credit (Mae Taeng Agricultural Office, 1990).

Mae Taeng has a busy market, as it is well-situated on both a main road and the Ping river connecting Chiang Mai with the North. Local marketing activities include internal trading, buying and selling within or between the villages to the district center, or as far as Chiang Mai city. The study area itself has good transportation facilities, with routine bus or pick-up trucks running daily at various times between the village, district center, and the city. The farmers themselves often have their own vehicles, such as trucks or motorcycles-with-side-car to transport their products for sale. In each village, middle persons also collect the products from the farmers for sale to the city

or elsewhere. In some cases, an outside middle person will join in the buying competition. However, sometimes farmers will choose to bring their own products to the city by themselves. Their actions depend on the negotiation and price satisfaction between the farmers and middle persons.

Not only agricultural products, but also many small business products ranging from electronic goods to household merchandise, flow along the road connecting villages with district and town. Information from agricultural news to consumer advertisements are also easily transported through the frequent movement of villagers and townspeople, and of course through the presence of television in all the villages. This, combined with other education and cultural beliefs, influences the attitudes of villagers and their actions regarding their allocation of labor and land resources and other aspects of decision making (Figure 3).

2.2 Description of sample households

2.2.1 Categorization of households by farm size

Household differences in economic level and available feed resources were found to affect many aspects of pig

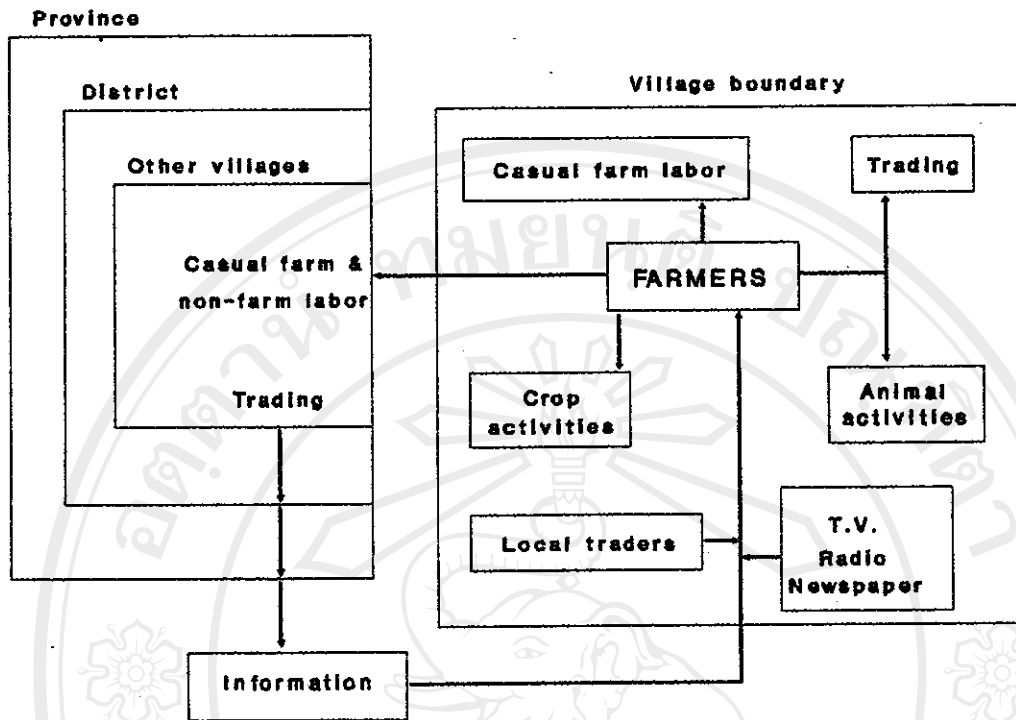


Figure 3. Framework depicting farmers' activities on and off the farm.

management. The size of paddy area and total landholdings generally reflect economic standing. Furthermore, the availability of rice by-products for pig feed is greater for households with large paddy area. Thus, for purposes of analysis, the 140 sample households were divided into three groups according to paddy area. The first group consists of 63 households with the smallest-sized paddy area (up to 4 rai, or 0.64 ha); the second group includes 67 households with medium-sized paddy (5 to 9 rai, or 0.8 to 1.44 ha); the third group contains the

remaining 10 households with relatively larger area of paddy (10 to 18 rai, or 1.6 to 2.88 ha). In fact, not only the paddy area, but also the total landholding of the three groups increases and reflects their different economic levels. As will be seen, this often affects the management practices and scale of returns of the pig farmers.

2.2.2 Demographic characteristics

Characteristics of the family units in the study were compiled from survey results. They indicate an average family size of five, with averages of 3.3 adults (aged 16 to 64, excluding school-goers), 0.76 elders (over 64 years), and 1.1 children (under 15 years or still in school). The average age of household head is 48 years, and the educational level of household head generally does not exceed "Pathom 4" (grade 4). Interestingly, the distribution of adult to child ratios indicates that over 60 percent of households for all three farm size groups have adult to child ratios of 1:0.5 or less, which would be considered quite low in comparison with many other developing countries, and may reflect the effective communication and education which reaches the countryside (see Appendix A).

2.3 Household resource allocation and income

2.3.1 Land use

Farmers in the study area utilize a diversity of cropping systems. Generally speaking, they divide their crop land into paddy, field crops, and vegetable crops (Table 3, Figure 4). Small-scale farmers with the least land available tend to plant nearly half their land to field crops, with rice a close second. Medium and larger-scale farmers, however, commit most of their land to rice, with smaller areas for vegetables and field crops to be cultivated after rice.

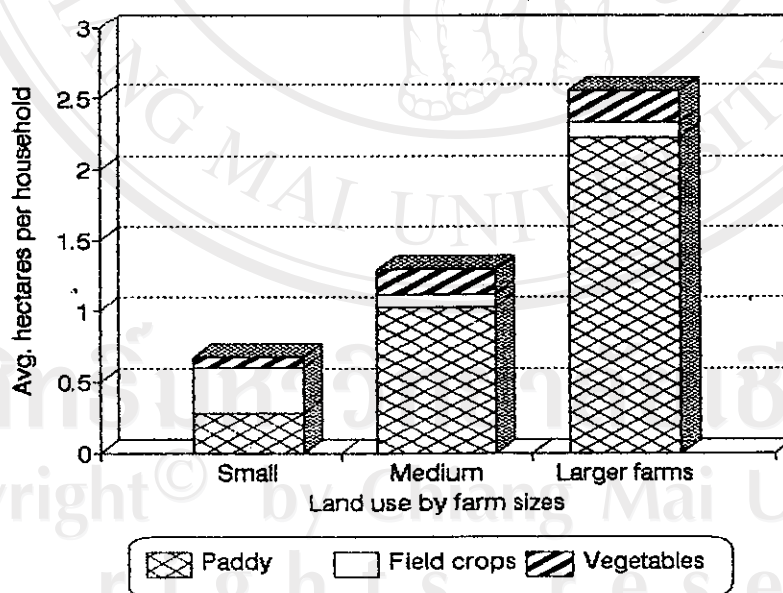


Figure 4. Land use and area.

The noticeably smaller plot size for small and medium-scale farmers is because they tend to divide their land into many plots in order to plant more than one crop at one time. They say that if one crop fails, they may have some yield from the other crops, utilizing, in other words, risk avoidance strategies by diversification. Larger scale farmers, however, may not plant crops in their full area, if they are aware that labor scarcity may occur. While the smaller-scale farmers may use their marginal land for planting crops before the rainy season, the larger-scale farmers tend to ignore their marginal land, and use it only during the rainy season.

Table 3. Land use and area

| Crop type | Average household landholding and use | | | | | |
|----------------|---------------------------------------|------|--------------|------|--------------|-------|
| | Small farms | | Medium farms | | Larger farms | |
| | ha | rai | ha | rai | ha | rai |
| Paddy | 0.28 | 1.75 | 1.02 | 6.40 | 2.22 | 13.90 |
| Field crops | 0.33 | 2.05 | 0.09 | 0.58 | 0.11 | 0.70 |
| Vegetables | 0.08 | 0.48 | 0.18 | 1.10 | 0.22 | 1.40 |
| Avg total area | 0.69 | 4.28 | 1.29 | 8.08 | 2.55 | 16.00 |

Source: Formal survey, 1990.

The sequence of crops planted varies somewhat between the farm sizes, as does the diversity of crops chosen (Table 4, Figures 5-7). Because many small-scale farmers consider that the little land they own is not enough to produce rice

Table 4. Crop sequences chosen by farmers

| Crop type | Percent of farmers planting the crop | | |
|----------------|--------------------------------------|---------------------|---------------------|
| | 1st crop Jun-Nov | 2nd crop Nov-Feb | 3rd crop Dec-Apr |
| Small farms | | | |
| Rice | 50.8 | 22.2 | 0.0 |
| Vegetables | 36.5 | 3.2 | 1.6 |
| Pepper-Garlic | 0.0 | 47.6 | 9.5 |
| Tobacco | 4.8 | 6.3 | 46.0 |
| Pepper | 0.0 | 9.5 | 20.6 |
| Mungbean | 7.9 | 0.0 | 0.0 |
| Soybean | 0.0 | 3.2 | 7.9 |
| Garlic | 0.0 | 4.8 | 6.3 |
| Tobacco-Pepper | 0.0 | 3.2 | 7.9 |
| Ttl planters | 100.0 | 100.0 | 100.0 |
| Medium farms | | | |
| Rice | 97.0 | 3.0 | 0.0 |
| Vegetables | 3.0 | 0.0 | 3.0 |
| Pepper-Garlic | 0.0 | 47.8 | 26.9 |
| Tobacco | 0.0 | 1.5 | 35.8 |
| Pepper | 0.0 | 7.5 | 25.4 |
| Mungbean | 0.0 | 0.0 | 0.0 |
| Soybean | 0.0 | 35.8 | 3.0 |
| Garlic | 0.0 | 3.0 | 0.0 |
| Tobacco-Pepper | 0.0 | 1.5 | 6.0 |
| Ttl planters | 100.0 | 100.0 | 100.0 |
| Larger farms | | | |
| Rice | 100.0 | 0.0 | 0.0 |
| Vegetables | 0.0 | 0.0 | 0.0 |
| Pepper-Garlic | 0.0 | 20.0 | 80.0 |
| Tobacco | 0.0 | 0.0 | 20.0 |
| Pepper | 0.0 | 0.0 | 0.0 |
| Mungbean | 0.0 | 0.0 | 0.0 |
| Soybean | 0.0 | 60.0 | 0.0 |
| Garlic | 0.0 | 20.0 | 0.0 |
| Tobacco-Pepper | 0.0 | 0.0 | 0.0 |
| Ttl planters | 100.0 | 100.0 | 100.0 |

Source: Formal survey, 1990.

at a very profitable scale, they frequently substitute a diversity of other crops. Of the study households with small farms, only half plant a first crop of rice, while most of the rest plant vegetables. For their second crop, about half these farmers choose an intercrop of pepper and garlic (48 percent), which although labor-intensive, is also quite profitable. Other farmers plant rice again (22 percent), or other field crops. The most popular third crop is tobacco (46 percent), because this can be planted on marginal lands during the cool season. Since tobacco companies provide all the input costs such as seedlings and fertilizers, it is also an ideal crop for cash-poor farmers. Some farmers choose to plant pepper (20 percent) or other crops which they can plant on small plots of land.

Medium-scale farmers, however, almost always plant rice as their first crop. For their second crop many choose pepper with garlic for its high profits (48 percent), or soybean (36 percent) which can be planted directly after rice in the same plots. In cooler weather, favorite third crops are again tobacco (36 percent), and also pepper with garlic (27 percent), or simply pepper (25 percent). Since pepper with garlic requires relatively high inputs of seed and fertilizer, farmers who continue to plant it for a third crop must have sufficient cash on hand.

The larger-scale farmers always plant rice as their first crop, since their landholdings are large enough to obtain benefits. They frequently plant soybean (60 percent) as a second crop, if not pepper with garlic (20 percent) or simply garlic (20 percent). By far, the most common third crop is pepper with garlic (80 percent), reflecting their good economic condition. A couple farmers planted tobacco instead (20 percent). The sequence of crops for these farmers suggests they can plant the crops in a way which will give them high benefits. In addition to the crop yield and profits which they can expect, they can also make use of by-products, such as rice bran and broken rice. These can actually be sold to other farmers or else used in their own pig production. The two larger-scale farmers who are rice millers will have even more benefit by collecting these by-products during harvest season. The variation between farm sizes in terms of what they plant for their first, second, and third crops is depicted in Figures 5-7.

An important point regarding the crop sequence presented here is that it reflects the order in which crops were planted by the farmer, rather than the exact crop seasonality or month. Hence small-scale farmers tend to plant their few crops before or after the real crop season, in order to have excess time for laboring in other bigger

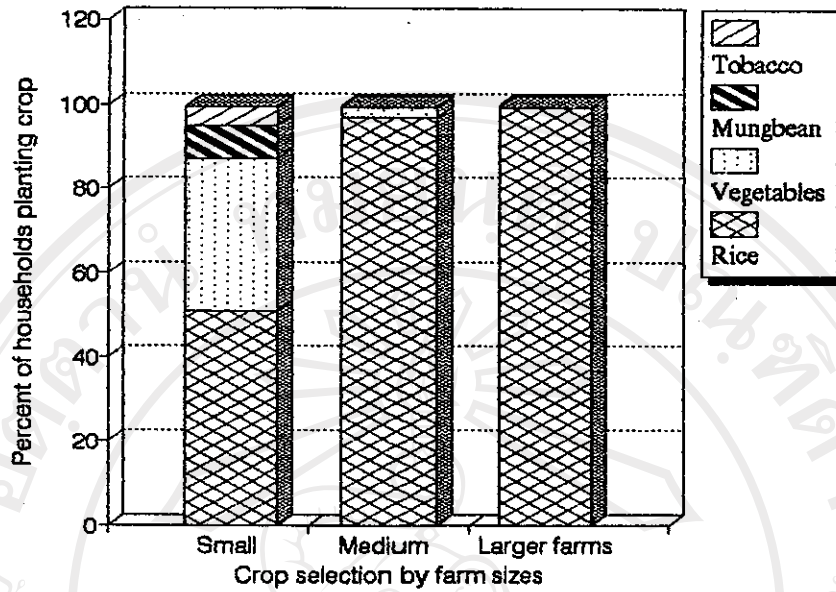


Figure 5. Selection of first crop.

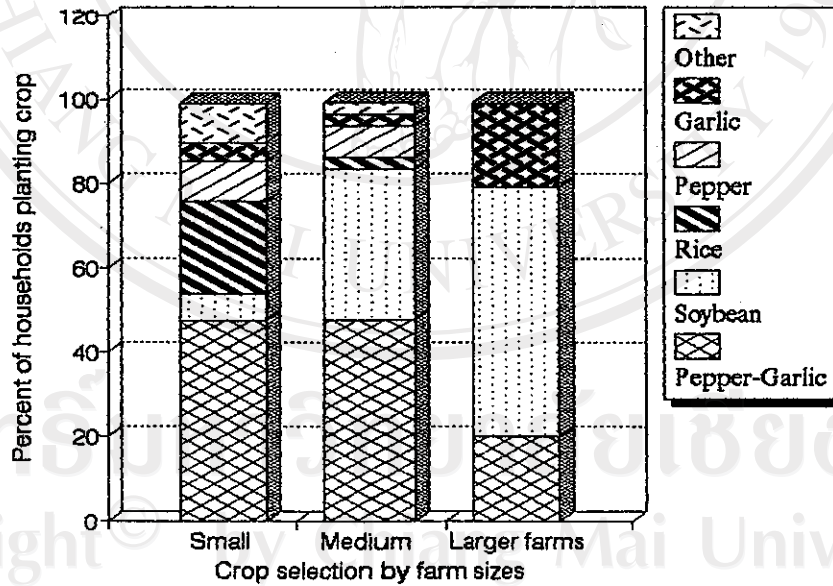


Figure 6. Selection of second crop.

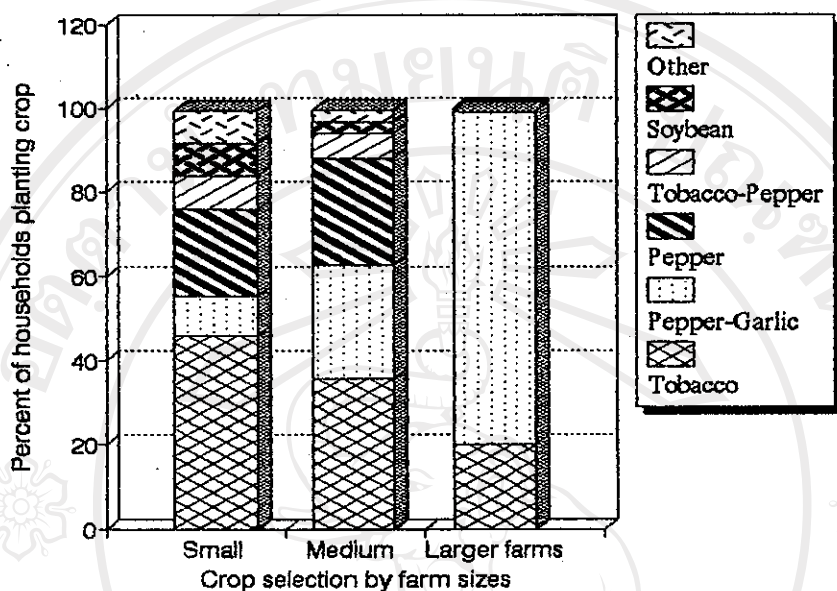


Figure 7. Selection of third crop.

farms. Despite their small land, and absence during the peak agricultural season, they can develop a highly diversified farming system. The typical seasonal sequence for crop planting in the study area and the region is illustrated in Figure 8.

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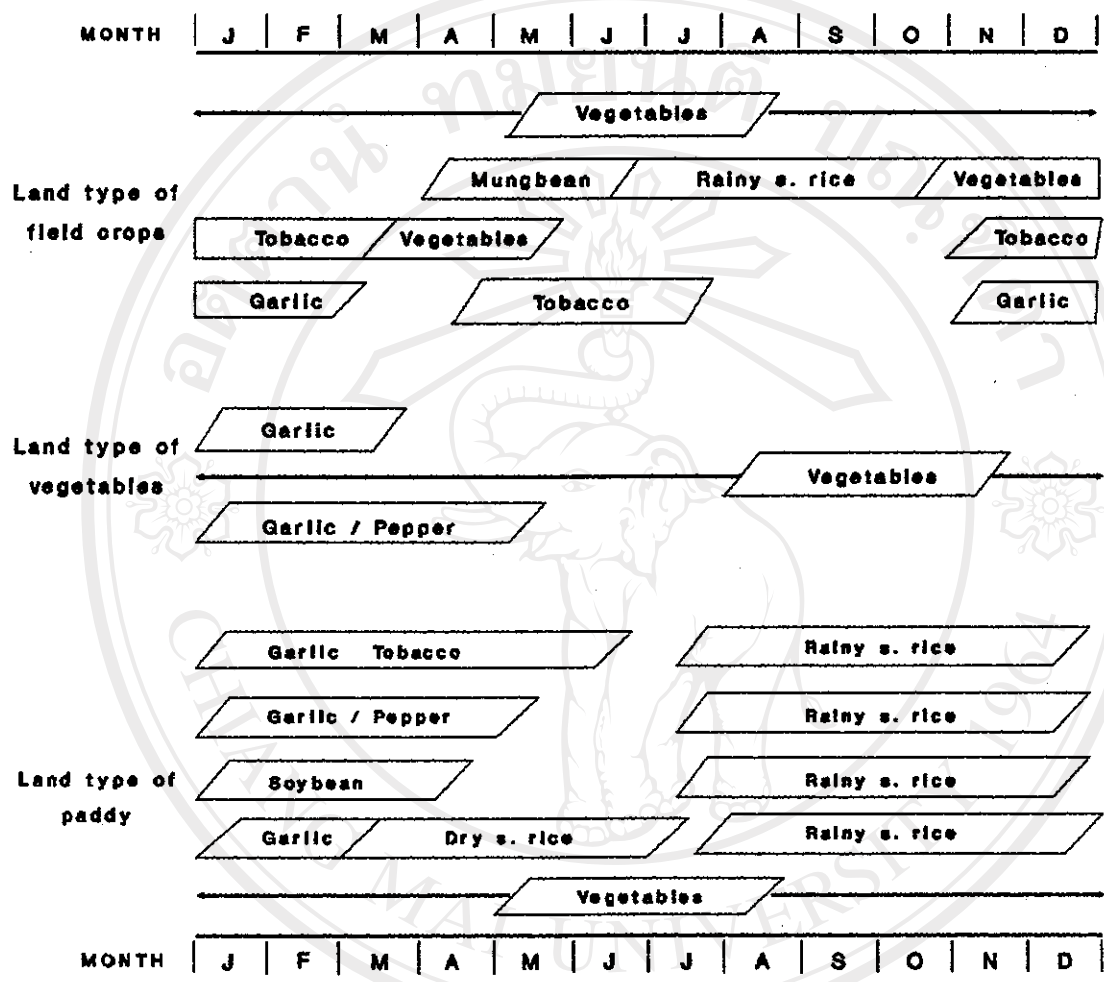


Figure 8. Typical crop sequence in Mae Taeng.

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2.3.2 Crop production

A comparison of labor hours allocated to crop production reveals that soybean, rice, and vegetables require the least amount of labor while the intercrops of pepper with garlic and tobacco with pepper demand the most labor (Figure 9, Appendix B). However, rice and soybean, as well as mungbean, produce the least amount of net income per area (all less than 4,000 Baht per hectare), which is why farmers with too little land are often reluctant to plant these crops. Vegetables, which require high inputs costs, produce quite satisfactory benefits, with average net income estimated as nearly 14,000 Baht per hectare. In addition, vegetables can be planted and tended in very small plots close to the house, a useful point for small-farm owners who may leave the home frequently for casual labor. However, vegetables also require high-cost inputs. The intercrops, by contrast, can provide ten to fifteen times the net income as that from rice and soybean (Figure 10). Thus it is a desirable second or third crop for farmers. However, despite the enormous profitability of growing pepper with garlic, one limiting factor previously mentioned is the need for enough cash to purchase all the required inputs. When garlic is dried, the net income far exceeds any of the other crops (103,600 Bt/ha), but it requires a two to three month

period for drying the garlic, and additional costs for labor during the drying process.

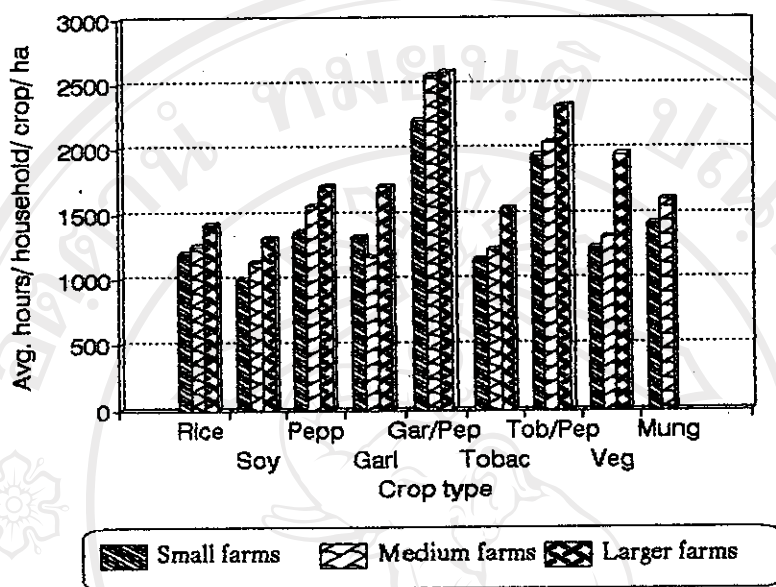


Figure 9. Labor in crop production: average hours per one hectare.

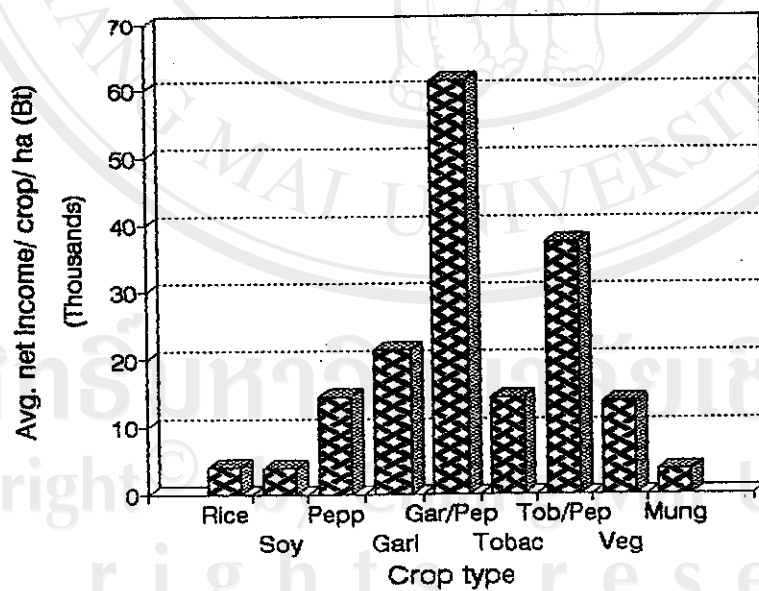


Figure 10. Net income from crop production.

The cost equivalent of labor hours was not deducted from the net income, which was calculated as gross income minus cash inputs. With equivalent farm wage labor rates as high as 60 Baht/day, the result of subtracting estimated labor costs for rice, soybean and mungbean would actually appear as a net loss to the farmer of several thousand baht. This would not reflect the actual situation of the farmers, who continue to plant rice for their livelihood, and consider it a necessary and productive activity.

2.3.3 Animal husbandry

In contrast to crop production, animal husbandry requires comparatively less labor, typically less than an hour per day. Annual labor requirements depend on the number of times the animal stock is raised per year. Some animals, such as chickens, ducks and pigs, are raised 2 or 3 separate times during the year. Others, such as cows and buffalos, reach their selling age only after 2 or 3 years, so the number of times they are raised per year must be expressed as a fraction. An estimate of annual labor hours required per animal type can be obtained by summing the hours required per raising period, and then multiplying by the number of raising periods per year. According to interviews with farmers from the study group, chicken, ducks

and pigs require the least amount of labor per year, but even the more than 200 hours required per head of cow and buffalo can be considered few in comparison to crop production hours. This is one of the strong advantages of animal husbandry: it requires little extra allocation of labor resources, which can be focused therefore on other activities.

Table 5 indicates typical labor expenditure and gross income from animal husbandry, as reported by study participants. Apparently, chickens and ducks gross very little income per head per raising time (respectively 30 and 40 Baht), while pigs gross on average 1254 Baht per head per time. If a type of animal is raised continually throughout the year, annual income can be estimated by multiplying the results of one raising period by the number of raising periods in a year. Further multiplying by the number of animals per household gives an estimate of the income which that household would gain in an average year from all its animals. Although income is small, labor requirements are few, making animal husbandry a common component of many small-scale farming systems.

Table 5. Labor requirement and gross income in animal husbandry.

| | Chicken | Duck | Cow | Buffalo | Pig |
|--|---------|-------|--------|---------|--------|
| Labor used per head per raising time (Hrs) | 32.0 | 37.3 | 580.0 | 675.0 | 74.6 |
| Times raised per year | 3.0 | 3.0 | 0.4 | 0.3 | 2.0 |
| Est. annual labor if raise one head/time (Hrs) | 96.0 | 120.0 | 243.7 | 224.7 | 149.3 |
| Gross income per head per raising time (Bt) | 30.0 | 40.0 | 4000.0 | 3900.0 | 1253.3 |
| Est. annual gross income if raise one head/time (Bt) | 90.0 | 120.0 | 1680.0 | 1287.0 | 2506.7 |
| No. animals per household | 10.3 | 4.9 | 2.1 | 1.1 | 4.5 |

Notes: Total of 103 farmers interviewed. Figures are averages.

Source: Informal and Formal survey, 1990.

2.3.4 Labor on and off the farm

2.3.4.1 Household management of labor and income

Every household must make decisions on the sort of work which its members will undertake. Household management is therefore the result of the interaction of economic need with social resources (labor skills in the house, labor needs on the farm, and job availability outside). The interaction of these factors culminates in each household's particular allocation of labor on and off the farm, with effects on sources of resulting income.

Adult labor and resulting income can be divided into two categories: that deriving from work on the household's

own land, including agriculture and animal husbandry, and that from work outside. Outside work can take a wide variety of forms, which can be classified for convenience as casual farm labor, casual non-farm labor, and trade and business. Table 6 indicates both annual labor and income for households from different size farms. The data indicate that economic resource (measured by farm size) affects labor allocation, which in turn interacts with amounts and sources of household income.

Table 6. Household labor and income components.

a. Distribution of household labor hours

| Type of labor | Average hours per household per year | | |
|----------------|--------------------------------------|--------------|--------------|
| | Small farms | Medium farms | Larger farms |
| Own farm | 715.7(33.8) | 1701.2(61.9) | 2574.8(84.8) |
| Outside source | 1403.2(66.2) | 1048.7(38.1) | 460.0(15.2) |
| Total hours | 2118.9 | 2749.9 | 3034.8 |

b. Sources of household income

| Source | Average annual income per household | | |
|----------------|-------------------------------------|--------------|---------------|
| | Small farms | Medium farms | Larger farms |
| Own farm | 30130 (66.2) | 52156 (75.0) | 122500 (90.5) |
| Outside source | 15403 (33.8) | 17373 (25.0) | 12900 (9.5) |
| Total income | 45534 | 69529 | 135400 |

Note: Figure in parentheses are percentage of each household's farm size.

Source: Formal survey, 1990.

The trend is for households with less land to devote more time to outside activities than households with larger landholdings. Those households directing their labor outside the farm achieve proportionately more income from their outside sources, in comparison to households which concentrate their labor on their own (larger) farms. However total annual income is still significantly less for households from small farms than from larger farms.

Thus, small-farm households spend only one third of their labor hours on their own land, and the remaining two-thirds in outside work, consisting primarily of casual labor. Their income from off-farm activities comprises an important one-third of their total household income. In contrast, farmers from medium-sized farms spend nearly two-thirds of their labor on their own farm and gain three quarters of their household income from their own farm labor. Farmers holding the most land, however, spend 85 percent of their labor hours on their own farms, and average very few hours per year in off-farm activities. They naturally collect the vast majority of their income from their larger productive farms, and less than 10 percent from off-farm work.

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The differences in amounts of on and off-farm income reflect the farming capacity of the three groups, as well as their abilities and concerns in finding other sources of income-generation. The decisions about labor allocation likewise reflect and influence the economic standing of the households. The interaction of both these social and economic characteristics of each household therefore has an overall effect on the households' functioning.

2.3.4.2 Types of rural employment

Involvement in off-farm labor provides an important source of income, especially for households with little land. Therefore a closer look at rural employment is warranted. Households from different sized farm groups in the study responded differently to the availability of casual labor employment and the opportunities for trade and business. Trends are illustrated in Figures 11 and 12, with a detailed account in Appendix C.

Small farm households devote a large amount of their labor hours to activities off their own farms. This off-farm labor is mostly wage labor, divided into casual farm labor (57 percent) and casual non-farm labor (28 percent), with a small percent devoted to independent trade

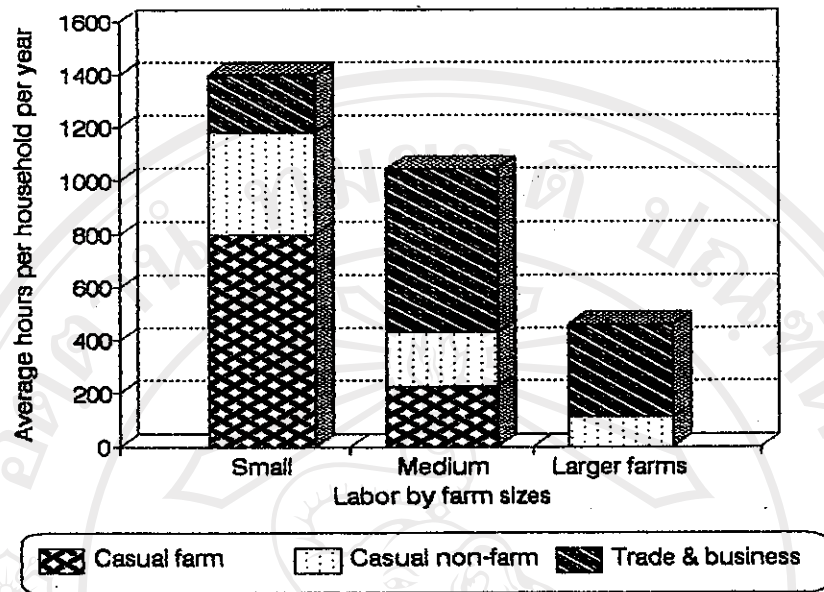


Figure 11. Hours devoted to labor activities outside the farm.

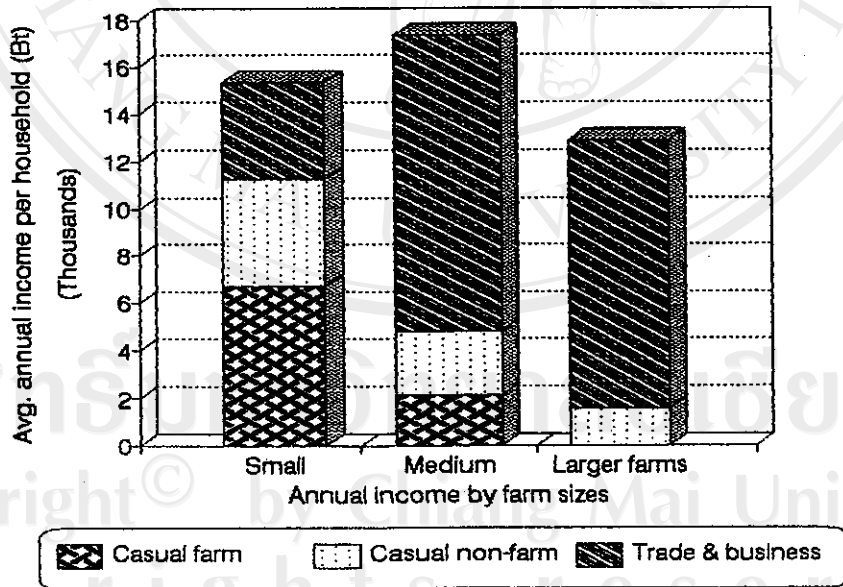


Figure 12. Annual income from labor activities outside the farm.

activities. Since these farmers have fewer fields of their own to cultivate, they can respond to the demand for farm labor in peak agricultural seasons on other large often commercial farms. Their work in casual non-farm labor is frequently wage construction work, undertaken when agricultural activity is low. These farmers spend relatively little time in trade and business, which is of a small scale, such as maintaining a small stall at the local market. Naturally, most of the income from their off-farm work is derived from casual farm labor (44 percent), with the remainder split between casual non-farm labor and trade and business.

Although medium farm household members work relatively fewer hours off their farms than those from small farms, when they do so, they spend over half those hours in trade and business. These activities include maintaining small grocery stores, a beauty store, and selling food and household items at the market. Thus they collect the major source of their off-farm income from trade and business (72 percent), with the remainder from casual labor which includes agricultural work as well as construction work.

The larger farm members, who only devote a small

fraction of their labor to off-farm activities, spend the great majority of it in trade and business, and record no hours spent in casual farm labor. They derive as much as 88 percent of their off-farm income from their business activities, which can include managing grocery stores or even rice mills, as well as sometimes acting as middlemen in crop marketing. Even those few who engage in wage labor tend to obtain the more skilled jobs in construction, so that their off-farm income, whatever the source, is generally good. Their few hours off the farm, however, reflect their tendency to devote more labor to agricultural work on their own larger farms. There too they achieve greater profits than their neighbors from the smaller farms.

The distance which farmers typically travel to get to their off-farm work-sites varies for farmers from the different farm-size groups. Those from small-farm households generally work near their village or at least within the district. This is because most of the agricultural labor they do is on large farms in the same area. Construction work may bring them to the district town. The same is true for medium farm workers, except that they are more likely to go beyond the district for work, whether construction or trading. Workers of larger farms, however, typically find work outside their own district, and therefore far from

their original village (75 percent). This is because their trading and business activities, especially as rice millers or middlemen, often requires visits to the town or to Chiang Mai city itself. Construction work, which has participants from all farm size groups, is always available both inside the district and in the city area, since land development and real estate business has been booming in the province for the past two years.

2.3.4.3 Casual labor

The allocation of household labor into casual labor has two aspects: the numbers of household members who will leave the home to work outside and the time of year during which they will go. In terms of numbers of casual labor workers per household, most small farm households send two persons (78 percent of households), which is a good reflection of the importance they put on casual labor (Figure 13, Appendix D). Just over half of medium-farm households will send two persons (57 percent), while 27 percent may have only one person in casual labor. As observed, large-farm households often avoid casual labor entirely (60 percent), with only 30 percent of households having two persons employed outside.

Observing the distribution of casual labor by month as illustrated in Figure 14 shows that large-farm members never

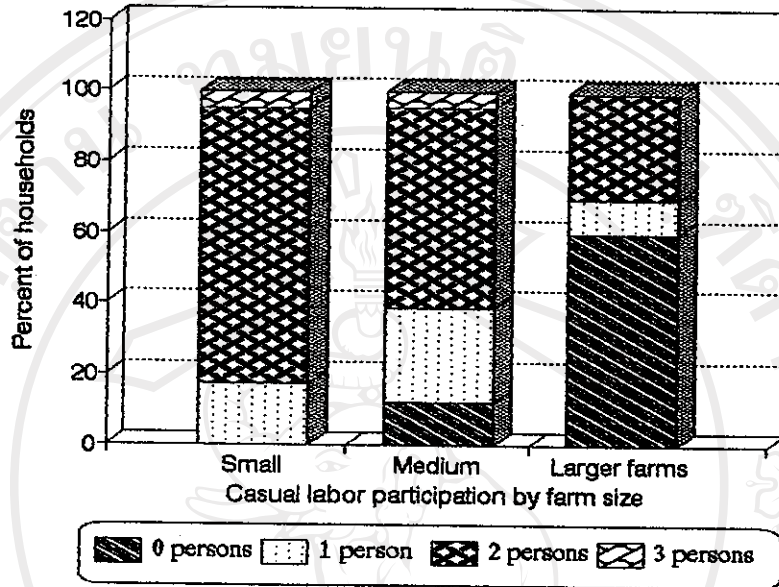


Figure 13. Number of casual laborers per household.

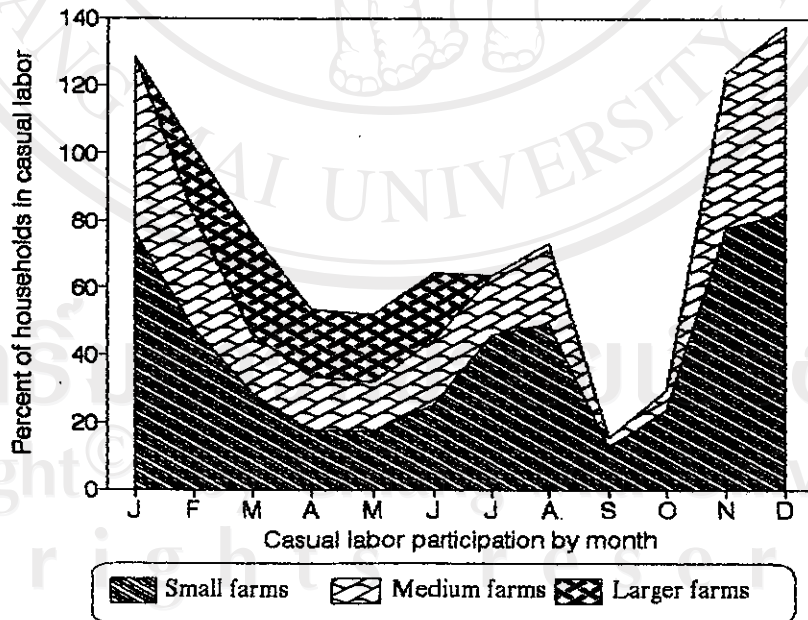


Figure 14. Seasonal distribution of casual labor.

leave their farms for casual labor during the rice planting season (July through November) or the months immediately after when they can grow cool season crops (December-January). In fact, the few households of this group which do work in casual labor do so only during the dry season (February through June), when construction work is plentiful. Small-farm members, however, work outside throughout the year: nearly half of the households have members working outside during the rice planting months, when demand for casual farm labor is high. An even larger percentage of households works outside from November to January (76 to 83 percent), in both farm and construction work. Medium-scale farmers exhibit a similar trend as the small-scale farmers, although overall percentages are lower. Since their farms are slightly larger, they do not join casual labor as often as small-scale farmers, and prefer to maintain small market activities instead (Appendix D).

2.4 Household budgets

Study households reported on their annual income and expenses, from which annual savings were estimated.

Depending on the economic standing of the household, as represented by its farm size, strong differences between the households in the three groups can be observed (Table 7 and Figure 15). The smallest farm households have average annual incomes of less than Baht 45,000; with average expenses of over Baht 32,000, their estimated savings are extremely small. In fact, they manage to save only 29 percent of their annual income.

Table 7. Summary of household budget (in Baht).

| Farm size | Income | Expenses | Savings (est.) | Savings as % of income |
|-----------|---------|----------|----------------|------------------------|
| Small | 45,534 | 32,507 | 13,026 | 28.6 |
| Medium | 69,529 | 36,334 | 33,195 | 47.7 |
| Larger | 135,400 | 49,060 | 86,340 | 63.8 |

Source: Formal survey, 1990.

Medium farm households on average collect nearly 70,000 Baht in annual income, and with average expenses similar to that of the small farm households, they can save proportionately more money. Their estimated savings of Baht 33,000 figures about 48 percent of their annual income. The larger farm households, in contrast, raise three times as much income as the small farm households, averaging Baht 135,000 per year. Yet with limited annual expenses, they save on average over six times the amount that small

farmhouseholds can save. Their annual savings are as much as 64 percent of their annual income.

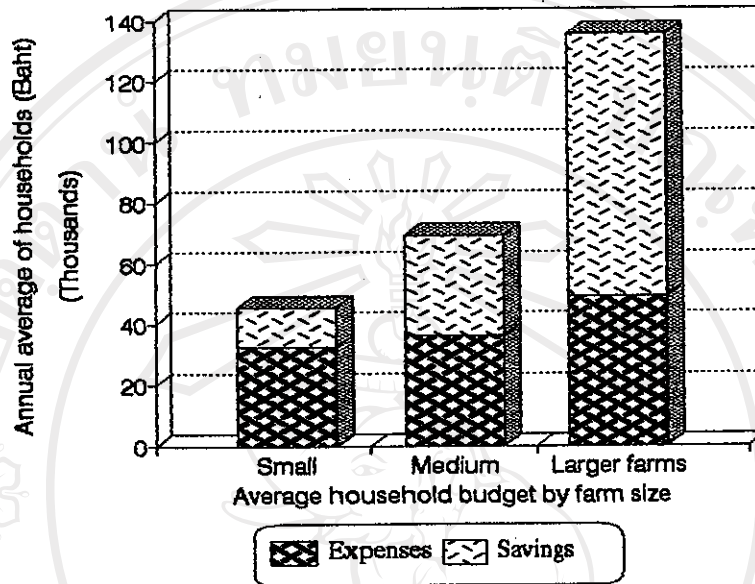


Figure 15. Annual household expenses and savings.

The distribution of households by income levels shows not only the differences between household groups in their mean income, but also the differences in proportions of households in a given income bracket (Figure 16, Appendix E). Thus the great majority of small-farm households had annual incomes in the lowest bracket: 80 percent had 50,000 Baht annual income or less. Only a tiny fraction ever collected more than 100,000 Baht. On the other hand, only one third of the medium farm households received low incomes of 50,000 Baht or less, while over half generated incomes

above that and ranging up to 100,000; quite a few households actually got more than 100,000 Baht. Large farm households were predictably the most successful in income-generation: the large majority (70 percent) received over 100,000 Baht with the wealthiest household gaining up to 300,000 Baht per annum.

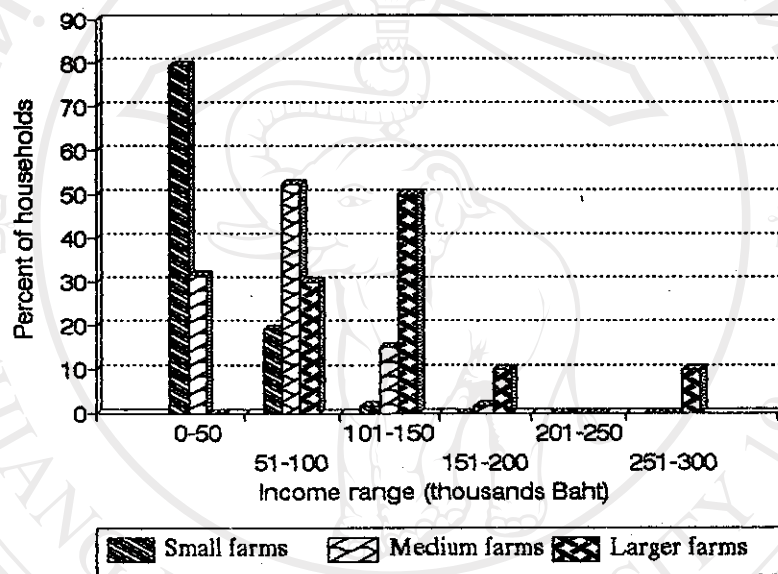


Figure 16. Distribution of annual income (household averages).

A distribution of households according to their annual expenses also shows some differences between the three farm size groups, but not so dramatically as for income (Figure 17). Over 90 percent of small farm households had annual expenditures totalling less than 45,000 Baht. Three-quarters of the medium farm households

also fell into this low range, but another quarter had annual expenses ranging up to 75,000 Baht. The expenses of the largest farm households generally did not exceed 45,000 Baht, with the exception of 2 farmers whose annual expenses exceeded 100,000 Baht. These two farmers are rice millers, who have high operation expenses, in addition to high annual incomes.

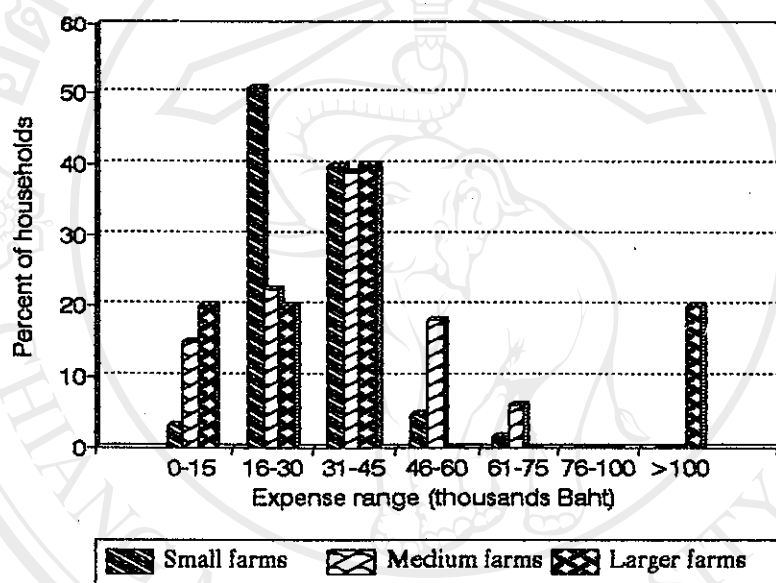


Figure 17. Distribution of annual expenses (household averages).

Finally, a distribution of households by annual savings indicates the range of savings available to households of different economic standing (Figure 18). Household savings were roughly estimated by deducting reported annual expenses from reported annual income, since farmers themselves had no records nor confident memory

regarding this point. The annual savings for small farm households is seen to be restricted to a fairly narrow range: almost 90 percent of these small-farm households save less than 25,000 Baht, and a fair number actually suffer a net loss. Most of the medium farm households, however, saved between 10,000 and 30,000 Baht annually, with some households saving even more. The range of savings by larger farm households, in contrast, was much higher than that for either of the other two groups. None of these households reported less than 26,000 Baht savings, and over half netted beyond 75,000 Baht. The very wealthiest household had savings in the amount of 172,000 Baht. The large proportions of small-farm households with limited savings in contrast to the high proportion of large farm households with enormous savings demonstrates the principle that larger starting resources enable benefits of an even greater scale.

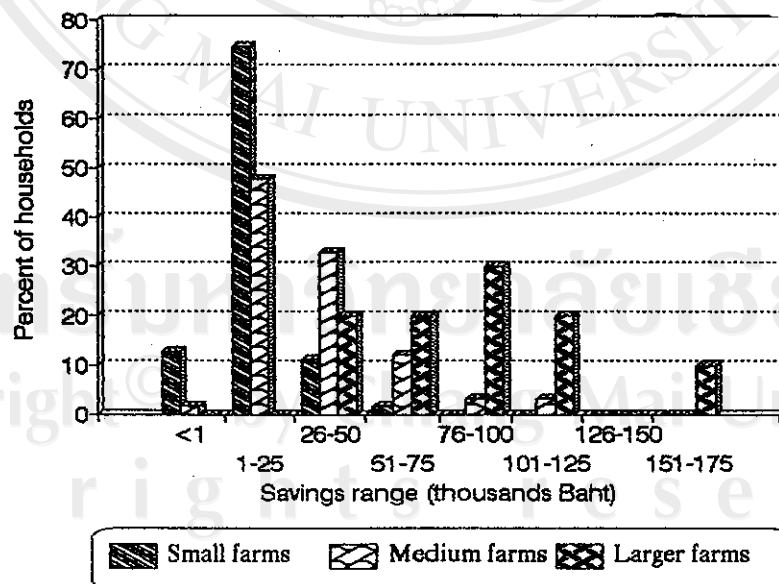


Figure 18. Distribution of annual savings (household averages).

2.5 Interaction of social and economic components in pig-raising and resource allocation.

In the early stages of the study, results from the formal survey indicated that pig farmers of Mae Taeng could be classified economically or socially according to the size of their rice farms. Because paddy size reflected general economic standing, as borne out by various economic indicators discussed in this chapter, the division of farmers into three groups (small, medium and larger-scale farmers) was helpful in analyzing the social and economic components of farmers' households. In general, as farm size and economic standing increased, farmers' scale of household and farm expenses, income and savings also increased. In particular, average annual income and savings for farmers from larger farms were much greater than those for farmers from either small or medium sized farms (Table 7 and Figure 15).

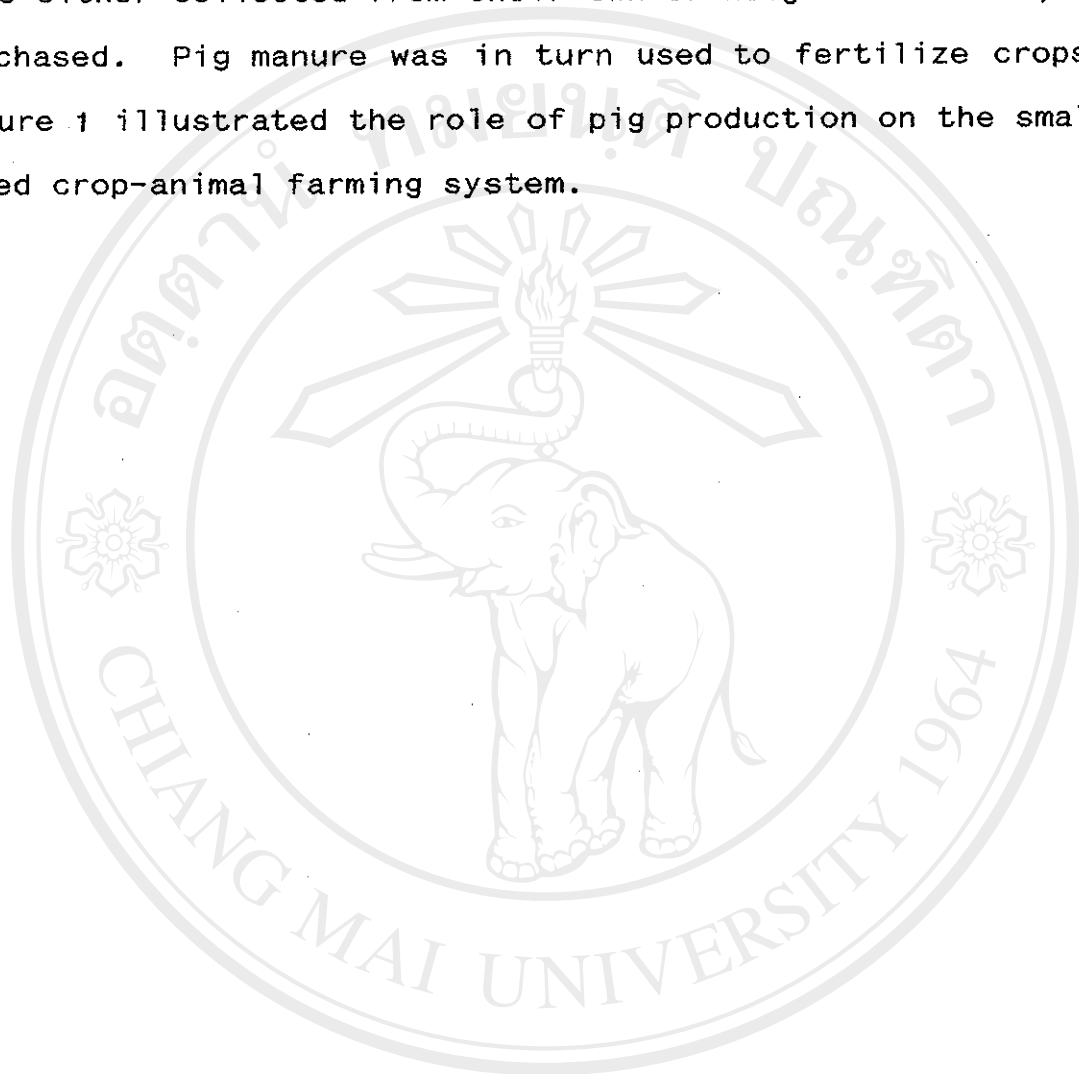
The combination of economic and social resources, such as income, land, and labor, were seen to influence the farmers' decision-making, particularly regarding the

technical aspects of farm management: crop selection, crop sequencing, animal husbandry. Therefore both economic and social factors interacted to affect farmers' technical concerns on the farm. Data from the formal and informal survey indicated that small-scale farmers incorporated greater crop diversity on their farms to make the best use of their limited land and limited time available to cultivate (given their economic need of casual labor jobs). In contrast, larger-scale farmers always planted rice as their first crop, because it could be profitable at a larger scale, and spent little time in pursuit of off-farm income.

This led to the situation that larger-scale farmers with an economic advantage could increase their success by obtaining plenty of rice by-products, from their own paddies, or from their secondary businesses as rice millers. The connection with animal husbandry followed: the more free rice by-products available, the more cost-effective the pig production because the major production cost (feed cost) could be reduced.

When allocating resources to various farm enterprises, farmers tended to invest few labor hours and little capital into pig production, especially in comparison to that for cropping activities. Despite low inputs,

returns were generally acceptable to farmers. When available, they added rice by-products to pig feed, which were either collected from their own or neighbors' farms, or purchased. Pig manure was in turn used to fertilize crops. Figure 1 illustrated the role of pig production on the small mixed crop-animal farming system.



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