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RURAL OFF-FARM EMPLOYMENT ASSESSMENT PROJECT

Rural Off-Farm Employment in Thailand:

Phase I Survey Results

by

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FOREWORD

This paper is the second in a series of reports produced by the Rural Off-Farm Employment Assessment Project of Kasetsart University. The Project is funded by the U.S. Mission of the Agency for International Development in Thailand under Project No. 493-0306. The objective of the Project is to provide information to the Royal Thai Government, USAID and other international donors, to be used to identify and develop appropriate policies and programs for the rural non-farm sector. The Project began in August, 1979, and is scheduled to continue for two years. In addition to Kasetsart University, Chiang Mai, Khon Kaen and other universities are involved in data collection and analysis. Ohio State University and Michigan State University are providing technical assistance to the Project. The views expressed in this paper do not necessarily represent the views of the Royal Thai Government, USAID, or any of the participating universities.

This paper presents the results of the first stage of research in this project, referred to as Phase I. It will be supplemented by a companion Research Paper No. 3, which will provide more technical discussions concerning the details of preparation, field work, questionnaire design and administration, etc. for the Phase I Surveys.

This report makes frequent use of the term, rural non-farm or rural off-farm enterprise. These two terms are used interchangeably. They refer to all economic activities other than farming which take place in rural areas. Thus, the village survey discusses household non-farm enterprises, for example; this concept covers the making of baskets, mats, knives, pottery, etc. within the village household. It excludes activities of an agricultural nature (growing rice, herding cows) as well as household activities of a non-economic nature (visiting the temple, preparing food for the family). These concepts are discussed and dividing lines used for determining inclusions in different categories explained in more detail in Research Paper No. 3.

The co-authors of this paper have summarized the results of studies done in Phase I of the Project. It is obvious, though, that the results reported here represent a group undertaking in which a large number of people participated. A full list of the participants in this phase of the work is provided at the end of this paper; as the reader will see, it is a very large group indeed. If we have done less than full justice to the information gathered as a result of their efforts, we hereby offer our apoligies. We would also like to thank our secretary,

Mrs. Phatcharin Fiumnoh, for her careful and accurate typing.

Copies of this paper can be obtained in Thailand from Dr. Tongroj Onchan, Center for Applied Economic Research, Faculty of Economics and Business Administration, Kasetsart University, Bangkok 9, Thailand. Copies can be obtained in the U.S. from Dr. Carl Liedholm, Off-Farm Employment Project, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 48824, or from Dr. David H. Boyne, Department of Agricultural Economics and Rural Sociology, Ohio State University, 2120 Fyffe Road, Columbus, Ohio 43210.

A list of the papers available from this project appears at the back of this paper.

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I. INTRODUCTION

1.1 Rural Industry and Economic Development in Thailand. Thailand is one of the few developing countries which has succeeded in sustaining high rates of growth in output over long periods of time. From 1961 to 1977, the growth rate of Gross Domestic Product at constant prices averaged over 7 percent per annum. Manufactured output has grown at the very high rate of 10 percent per annum over this period, while agriculture, the dominant sector of the economy, has grown at a respectable 5 percent per year. Manufacturing has increased its share in GDP from 12.5% in 1960 to 19.0% in 1977, while agriculture's share declined from 39.8% in 1960 to only 28.1% in 1977.

In examining the growth of employment in manufacturing over this period, one must rely on a variety of data sources using different definitions. Available statistics suggest that the share of manufacturing in total employment rose from less than 4% in 1960 to over 10% in 1976.

Although manufacturing output and employment have expanded at high rates, this production has been heavily concentrated in Bangkok and surrounding areas. Outside Bangkok, official statistics suggest that industrialization has grown only slowly, and has contributed relatively little to total rural employment. In 1976, three-fourths of total employment in Thailand was in rural areas; of these, only 14.8% worked in all non-agricultural sectors combined. Manufacturing employed only 4.3% of the rural labor force. Significant increases in agricultural output (often based on an expansion of the cultivated area) have combined with increases in urban employment (primarily in the Bangkok region) to create jobs for increasing numbers of people; yet the steady growth of the population and labor force has continued to outpace this expansion in profitable job opportunities, with the result that unemployment and under-employment in rural areas continues to be a serious problem.

The promotion of industrialization outside of Bangkok has been discussed in Thailand for a number of years. However, attempts to encourage large-scale industries to locate in rural areas have met with little success.[1.] An alternative approach focuses on the support of small-scale industries outside the major urban concentrations, as a means of raising employment and income as well as laying the ground-work for further development in rural areas. The central research objective of the Rural Off-Farm Employment Assessment Project is to investigate the potential for increasing income, employment, and economic development through the promotion of rural

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1. See Isarangkun, C., Development of Agro-Industries, Small Scale Industries, Industries Satisfying Basic Needs of the Poor and Dispersal of Industries: Government Policies and Measures in Thailand, NIDA, 1979.

small-scale industries.

1.2 Objectives of this Paper. It is widely recognized in many countries of the world, including Thailand, that information concerning small scale and cottage industries is limited and generally inadequate. In many cases, statistical surveys and official reports have excluded small enterprises entirely. The registration of manufacturing firms in Thailand is enforced only for enterprises with 7 or more employees, or with two or more horse-power. Other surveys of industry cover only establishments with 10 or more employed persons.

The Phase I surveys in villages and towns were designed to help overcome this inadequate data base, for the selected areas studied. This paper, along with its companion Research Paper No. 3, explains the approach taken the Phase I surveys, and presents the results found in the course of those surveys.

1.3 Methodology.

1.3.1 Town Survey. As indicated in previous reports, the Phase 1 Town Survey covered 11 towns in 4 provinces, as follows:

Chiang Mai:	Chiang Mai City (Muang) San Kamphaeng San Pa Tong
Khon Kaen:	Khon Kaen City (Muang) Ban Phai Chonnabot Nam Phong
Roi Et	Roi Et City (Muang) Chaturaphak Phiman
Suphan Buri	Suphan Buri City (Muang) Don Chedi

The basis for selection of these particular areas is explained in Paper No. 3. In these towns, the enumeration covered all establishments located within the municipality or sanitary district boundaries. In the city of Chiang Mai, the survey also covered all establishments up to 5 km outside the municipal boundaries along each of the 5 main roads leading out from the city. In other areas, the survey was limited to the area within the administrative boundaries of the municipality or sanitary district. Within those areas, enumerators visited each house, building, shop, factory, or other type of work place. With exceptions noted below, a questionnaire was completed for each establishment engaged in any type of economic activity at that location.

Exclusions were primarily in the area of services. The following categories were all excluded from the survey: restaurants, bars, financial institutions, government offices and institutions, gas stations, other service establishments (other than a few specified categories such as repair services), shops in the central market, and push carts. Other commercial establishments (including wholesalers, retailers, brokers, etc.) were covered in Khon Kaen, Roi Et, and Suphan Buri, but were excluded from the survey in Chiang Mai.

1.3.2 Village Survey. The Phase I village survey was done in three stages. The first stage involved the collection of background information about economic activity, farm and non-farm, in all of the villages of the districts (amphoes) selected for study. This information was derived from interviews with a variety of local government officials: community development officers, agricultural extension workers, and others. The interviews were supplemented by detailed data provided by the National Statistical Office. This in turn lead in the second stage to the selection of villages for follow-up work, in the form of interviews with village headmen. These headman interviews were conducted in 74 villages, chosen in an effort to include all major agricultural and non-agricultural activities thought to exist in an area. The selection was thus not random but purposive; in a number of cases, villages were selected because information collected in the first stage interviews suggested special characteristics worthy of study (e.g. one village where everyone makes knives, or another where all households have tractors and year-around irrigation). The interviews generally took 20-30 minutes each, and involved the completion by the interviewer of a four page questionnaire.

The third and final stage in the Phase I village survey was a household questionnaire. This survey was undertaken in 33 villages, all but one of which had been included in the headman interviews. The selection of villages was once again purposive, designed to provide more detailed information to be used in selecting villages and households in the Phase II village survey. The sampling of households within those villages was done on a random basis. The sampling percentages ranged from 20% to 50%, varying with the degree of homogeneity of the village; in villages thought to be more homogeneous, a smaller sample was used.

1.4 Background of Areas Studied.

1.4.1 Population. Three of the four provinces under study are large by Thai standards, being among the 9 provinces (out of 72 in all) with population in excess of 1 million. Suphan Buri, with a population of 702,000, is somewhat smaller (see Table 1). As the Table shows, the population of these provinces in overwhelmingly rural.

Except in Chiang Mai and Khon Kaen, the population in municipal areas and sanitary districts are less than 20% of the total population of the district (see Table 2). The city of Chiang Mai, with nearly 100,000 people, is the biggest in the North, and has 58% of the population in the district--but only 8.5% of the population of the province. Similarly, Khon Kaen, with nearly 90,000 people, is one of the biggest

Table 1: Socio-economic Characteristics of the Areas Studied.

	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri
Total for province				
Population (thousands)				
Urban[a]	98	99	30	31
Rural[a]	1,052	1,230	1,014	672
Total	1,150	1,329	1,044	702
No. of districts	19	19	15	9
No. of villages	1,354	1,652	1,629	654
No. of households	231,857	n.a.	147,964	111,909
Total area (km^2)	19,432	13,404	7,856	5,383
GPP/cap, 1977(B)	7,513	4,542	2,670	9,534
No. of registered factories	1,379	1,461	879	431
In Areas Covered by Phase I Survey				
Population (thousands)				
Urban	98	90	30	23
Rural: Village[b]	13	23	11	12
Rural town	34	44	4	6
Rural total	47	67	15	18
Percentage of total population				
Urban	100	91	100	74
Rural	4	5	1	3
No. of districts/towns	3	4	2	2
No. of villages[b]	23	24	16	11

a/ In Thailand, the population of each of the 72 provincial capitals plus 35 other smaller towns ("Tambon Municipalities") are considered to be urban; all other area are classified as rural. In compiling this table we have drawn on up-to-date information for each of the provincial capitals (see Table 2); information on other urban municipalities-one each in Khon Kaen and Suphan Buri-are available only for 1970. The figures above are obtained by combining these older estimates for 2 smaller municipal areas with the newer figures for the provincial capitals. They thus understate the current urban population somewhat. Since the rural population is obtained by subtraction, it is overstated somewhat.

b/ This is the number of villages and population covered by headman

Table 2: Population in the Districts Studied, 1979.

Districts	Total Population in District (Persons)	Population in Municipal area or Sanitary District (Persons)	Percent of Population in Municipal and Sanitary Areas
Muang Chiang Mai	167,403	97,839	58.4
San Kamphaeng	78,165	14,921	19.1
San Pa Tong	102,307	18,605	18.2
Muang Khon Kaen	245,678	89,925	36.6
Ban Phai	123,679	24,285	19.6
Chonnabot	43,571	8,061	18.5
Nam Phong	86,226	11,952	13.9
Muang Roi Et	185,760	30,209	16.2
Chaturaphak	72,378	3,927	5.4
Muang Suphan Buri	126,465	22,544	17.8
Don Chedi	37,853	6,425	17.0

Source: Ministry of Interior.

towns in the Northeast; it has 37% of the population of its district, but less than 7% of the population of the province. The other two provincial capitals are far smaller, both in absolute size and as a share of total district and provincial population.

1.4.2 Income. The Northeast is the poorest region of the country in terms of per capita income, standard of living, and natural resource endowment. Roi Et is one of the poorest provinces, the second from the bottom of the national list, with per capita Gross Provincial Product (GPP) of only 2,670 baht in 1977, barely 30% of the national average (฿ 8,652). Khon Kaen is above average for the Northeast, with per capita GPP of ฿ 4,542 in 1977. Chiang Mai and Suphan Buri have double and triple per capita GPP of that in the Northeast; yet Chiang Mai's level is still only about 87% of the national average. Among the provinces in our study, only in Svphan Buri is average income per capita above the average for the country as a whole (about 7% above the national average).

The major source of income in all the areas studied is agriculture. Poor endowment of natural resources and infrastructure for agricultural production in the Northeast, particularly in Roi Et, helps explain the low income from agriculture in that area. In Suphan Buri, where per capita income ranked 25th in the nation in 1976, agricultural production is substantially higher. The irrigation system, which supplies over 80% of all farm holdings, has played a major role in raising agricultural production in that province. In Khon Kaen, by contrast, the irrigation system reaches only 3.2% of total farm land. In Chiang Mai the irrigation is not as extensive as in Suphan Buri, but a diversified cropping system has resulted in a productive and well developed agricultural system.

There are also substantial differences between the provinces in terms of non-agricultural activities. Suphan Buri is richer not only because its agriculture is more productive; over 15% of the income of the province comes from manufacturing, of which the largest component is sugar cane. By contrast, the share of provincial income earned in manufacturing was barely 8% in Khon Kaen and Roi Et. Chiang Mai is well-known for its small-scale and cottage industries; yet even in this province, the share of Gross Provincial Product derived from manufacturing was only 8.4%. In terms of modernization and availability of infrastructure, Chiang Mai is the most developed urban region of the country after Bangkok.

II. SURVEY RESULTS

2.1 Town Survey.

2.1.1 Magnitude of Non-agricultural Activities in Rural Towns.

In the four provinces covered by the survey, a total of over 6,000 establishments were reported, with employment of nearly 30,000 people. The total population of the towns surveyed was nearly 330,000. Leaving aside commercial activities- which were not enumerated in all areas- the ratio of manufacturing employment to total population varied from 2% in some locations to 10% or more in others.[1] There is no clear relationship between this ratio and town size; the ratio is barely 2% in Chaturapak (with 4,000 people) and barely 4% in Khon Kaen (with nearly 90,000), while it is over 18% in Chonnabot (with 8,000 people) and over 9% in Chiang Mai (the largest town in our sample). These ratios relate manufacturing employment to total population- men, women, and children; if the calculations could be made relative to the economically active labor force, they would be between two and three times these levels. The main other economic activities are commerce, government institutions and other services, and (particularly in some of the smaller towns) agriculture.

2.1.2 Enterprise Distribution. The distribution of establishments and employment by type of enterprise is shown in table 3. The more highly aggregated data in table 4 also show the distribution of employment by enterprise group in each of the towns covered by the survey. The following points stand out in these tables:

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1. These calculations are based on data in tables 2 and 4.

Table 3: Phase 1 Town Survey: Enterprise Distribution

	Establishments	Employment
1. Agriculture, food, and related products		
101 Rice mills	58	620
103 Bakeries	39	284
104 Candy making	64	321
106 Noodle making	66	327
111 Meat and fish preparation	74	378
116 Miscellaneous food products	42	218
120 Beverage bottling	6	444
Total, category 1	484	3,739
2. Textiles and wearing apparel		
201 Silk raising, spinning & weaving	633	1,666
204 Knitting	19	426
205 Making ready-made garments	75	712
207 Tailoring and dressmaking	583	1,838
220 Rope and fish net making	2	502
Total, category 2	,406	5,434
3. Wood, bamboo and cane products		
301 Saw mills	28	1,148
302 Wooden doors and windows	25	215
303 Wooden furniture	80	711
304 Wooden handicrafts	52	755
306 Lacquer ware	29	222
308 Mat making	311	819
Total, category 3	578	4,063
4. Non-metallic minerals, including ceramics		
401 Pottery, earthenware, ceramics	18	332
405 Cement products	66	569
Total, category 4	91	946

Table 3: (continued)

	Establishments	Employment
5. Metal products		
502 Metal household products	54	321
504 Structural metals, doors, windows, coils, screws and nuts	68	414
Total, category 5	242	1,540
6. Chemicals and chemical products		
602 Medicines and cosmetics	13	205
Total, category 6	31	335
7. Commerce		
702 Upland crop buyer	44	263
710 Wholesalers, food and agricultural products	58	274
711 Retailers, food and agricultural products	95	305
712 Wholesalers and retailers: non-agricultural products	267	1,090
713 Wholesalers and retailers, agricultural inputs	102	406
714 General store	1,043	3,058
715 Wholesalers and retailers, other	496	2,444
Total, category 7	2,151	8,033
8. Services		
801 Vehicle repairs	532	2,690
802 Mechanical repairs	195	1,288
803 Electrical repairs	171	573
Total, category 8	909	4,611
9. Miscellaneous		
903 Printing, publishing and painting	80	712
Total, category 9	189	1,136
Total, all categories except commerce	3,930	21,804
Grand total, all categories	6,081	29,837

Note: any subsector providing 200 or more in employment is separately shown. Other smaller subsectors not separately shown are included in the totals for each category.

Table 4: Enterprise Distribution of Employment, by Town

	Chiang Mai			Khon Kaen				Roi Et		Suphan Buri	
	Chiang Mai City	San Kamphaeng	San Pa Tong	Khon Kaen City	Ban Phai	Chonna-bot	Nam Phong	Roi Et	Chatura phak	Suphan Buri City	Don Chedi
1. Food, beverages, tobacco, and other processed agric. products	1,468	21	46	692	349	25	149	338	30	530	91
2. Textiles and garments	1,240	682	397	888	253	1,457	100	175	21	150	71
3. Wood, bamboo and cane	2,018	423	78	294	133	6	794	219	5	57	36
4. Non-metallic minerals	362	154	32	108	46	3	20	155	8	40	18
5. Metal products	877	24	1	301	102	13	7	100	0	83	32
6. Chemicals	137	6	0	102	9	0	53	11	0	11	6
8a Repairs	1,016	30	34	1,181	269	8	94	383	19	341	175
8b,9. Other services and others	801	8	1	168	79	2	0	63	0	50	25
Sub-Total	8,919	1,348	539	3,734	1,240	1,514	1,217	1,444	83	1,262	454
7. Commerce	(not enumerated)			3,886	1,076	110	359	1,717	69	538	278
Grand Total	–	–	–	7,620	2,316	1,624	1,576	3,161	152	1,800	732

2.1.2.1 Commercial Establishments- those in category 7- were enumerated only in three provinces (i.e. excluding the largest, Chiang Mai). In spite of that fact, commercial establishments comprise the largest single industry group, accounting for more than a quarter of all employment reported in the survey, and over 42% of employment in the three provinces where commerce was enumerated. If push-carts and establishments in the central markets had been included, it is clear that commercial establishments would account for over half of total employment in the towns enumerated. The detailed definitions of different enterprises within the commerce sector turned out not to be very useful; these have been revised for the Phase II work.

2.1.2.2 Textiles. After commerce, the most important enterprise categories from an employment point of view are in the area of textiles. Tailoring and dress making is a pervasive activity, with large numbers of small establishments in all provinces. 30% of the workers in these tailoring establishments are hired workers, and 14% apprentices, with the rest being working proprietors and family members. The average establishment was small, with only 3.1 workers; only a few reached as many as 8 employees. Silk raising, spinning and weaving include a few middle-sized establishments (13 with employment of 15 or more); 19 with 6-14 workers, and the rest essentially household producers. 75% of all employment in these silk enterprises is family labor. In the case of knitting and ready-made garments, each has a few large producers (over 50 workers), and a number of medium sized firms, concentrated in Chiang Mai Province.

2.1.2.3 Repairs. Employment in garages (vehicle repair), mechanical and electrical repair shops account for over 20% of all non-commercial establishments covered in the survey. For each of these three categories, employment is spread over a large number of small establishments (mostly 2-10 employers), widely dispersed throughout the area of study.

2.1.2.4 Wood, Bamboo, and Cane Products. The biggest single enterprise within this industry group is saw mills. There are 9 large saw mills in Chiang Mai, with over 50 employees each; the other 19 establishments reported in the survey range from 3 to 45 employees, ocurring in all four provinces of the study.

Producers of wooden craft items are all in Chiang Mai, as are 65% of the furniture makers. Mat making is in the hands of many small household producers, mostly located in Nam Phong.

2.1 2.5 Food and Other Processed Agricultural Products. This industry group is made up of a variety of relatively small enterprises. Rice mills, the largest enterprise in this group, are pervasive, in villages as well as towns, ranging in size from 1 or 2 workers to more than 50 employees. The extent of seasonality in this enterprise is surprisingly small, with employment ranging from a low of 442 workers to a peak of 695. Obviously the milling of rice is more evenly spread over the year than is its harvesting. The strongest case of seasonal variability in this sector (and indeed, in the whole survey) is tobacco curing, where employment in three establishments ranged from a low of 51 workers to a peak level of 908. The relatively small employment in bakeries is a reflection of the traditional Thai diet: rice is much more important than bread.

This category of processed agricultural products includes kenaf baling and cassava processing. In the survey, neither of these activities was significant (total reported levels of employment in all areas were 158 and 149 respectively). There are two explanations for these low reported figures. Many of these processors are located outside of the municipal area, and hence were not included in the survey. Furthermore, many firms combine these two activities with rice mills. No effort was made in this survey to separate different activities within a single firm; many such multi-purpose agricultural products processors were classified as rice mills, which tends to be the dominant activity in terms of employment, even when they also had other important product lines such as cassava and kenaf processing as well.

2.1.2.6 <u>Distribution of Enterprises, by Towns</u>. Table 4 presents information concerning the distribution of employment among the eleven towns covered by the survey, by enterprise group. Perhaps the most striking feature of ...

table is the extent to which the towns in the survey are specialized: in San Pa Tong, two-thirds of all manufacturing employment is in textiles (primarily knitting), while in Nam Phong, the same percentage is engaged in mat-making. In Chonnabot, over 95% of manufacturing workers are engaged in silk-making, while in San Kamphaeng over half are in other types of textiles (particularly ready-made garments). Preliminary explanations of this pattern of geographical specialization may be advanced in terms of the availability of raw materials (e.g. reed for mats), proximity to good markets (textiles in Chiang Mai province), or tradition (all products, but perhaps particularly silk); but until they are developed in more detail, such generalizations add little to our understanding. These questions are clearly ones which will be explored in the further work of the project.

In the two towns of Suphan Buri province, the concentration of manufacturing employment in the processing of agricultural products and repair services (including the repair of tractors and other agricultural implements) reflects the rapid growth in agricultural output and increasing mechanization in that province over the past decade. The relatively small level of employment in other manufacturing enterprises there is particularly interesting, and will be subject to further scrutiny by the project.

2.1.3 Labor Force.

2.1.3.1 Breakdown of Labor Force by Employment Categories. Tables 5 and 6 provide summary information concerning the labor force in establishments covered in the survey. Looking first at Table 5, which excludes establishments engaged primarily in commerce, during the survey week there were 3,930 establishments in the 11 towns enumerated. These establishments provided employment to 21,804 workers. Approximately half of that total employment was in Chiang Mai, and 35% in Khon Kaen, with Roi Et and Suphan Buri together providing the remaining 15%.

Over 50% of the labor force is hired labor, with family members and working proprietors comprising an additional 39%. In contrast with other countries where similar studies have been undertaken, apprentices are not a major part of the labor force in any of the areas surveyed. It is not surprising to find that, among the smaller firms in the survey (those with 6 or less workers), reliance on family members and proprietors is much higher, accounting for two-thirds of all workers in manufacturing firms, and 80% of the labor force in commercial establishments. Only among metal product manufacturers and repair shops are there significant numbers of hired workers among small producers.

The average number of workers per establishment ranged from 4.3 in Khon Kaen to 7.3 in Chiang Mai, averaging 5.5 for the survey area as a whole. The larger average firm size in

Table 5: Phase I Town Survey: Labor Force Characteristics: All Establishments Except Commerce Sector.

	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri	Total
No. of Establishments	1,488	1,811	293	338	3,930
No. of workers employed during survey week:					
Male	6,549	3,932	1,156	1,221	12,858
Female	4,307	3,773	371	495	8,946
Total	10,856	7,705	1,527	1,716	21,804
Hired	6,507	3,473	841	815	11,636
Family members	1,671	2,260	310	385	4,626
Working proprietors	1,774	1,447	297	325	3,843
Apprentices	904	525	79	191	1,699
Total	10,856	7,705	1,527	1,716	21,804
Workers during past twelve months					
Maximum	13,259	8,641	1,806	1,860	25,566
Minimum	7,751	4,676	893	1,113	14,433
Males/total workers	.60	.51	.75	.71	.58
Hired/total workers	.60	.45	.55	.47	.53
Workers/Establishments	7.3	4.3	5.2	5.1	5.5
Max/min employment	1.71	1.85	2.02	1.67	1.77

Table 6: Phase I Town Survey: Labor Force Characteristics: Commerce Sector.

	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri	Total
No. of Establishments		1,432	472	247	2,151
No. of workers employed during survey week:					
Male		3,033	1,010	396	4,439
Female		2,398	776	420	3,594
Total		5,431	1,786	816	8,033
Hired	not enumerated	1,843	671	146	2,660
Family members		2,092	630	417	3,139
Working proprietors		1,438	467	246	2,151
Apprentices		58	18	7	83
Total		5,431	1,786	816	8,033
Workers during past twelve months					
Maximum		5,895	1,951	884	8,730
Minimum		4,305	1,280	563	6,148
Males/total workers		.56	.57	.49	.55
Hired/total workers		.34	.38	.18	.33
Workers/Establishments		3.8	3.8	3.3	3.7
Max/min. employment		1.37	1.52	1.57	1.42

Chiang Mai is directly associated with the larger number of hired workers in that province. The number of family workers per establishment in Chiang Mai (2.3) is almost the same as in other provinces (2.1), while the number of hired workers is far higher (4.4, compared to 2.1 elsewhere).

Table 6 indicates that, for commercial establishments, the average firm size is significantly smaller (3.7 workers), and the share of family workers in the total work force (65%) is much higher than for non-commerce firms (hired workers and apprentices are of only minor importance, particularly in Suphan Buri).

It is interesting to note that the share of males in the total labor force varied quite widely, ranging from only 51% in manufacturing firms in Khon Kaen to over 75% in manufacturing firms in Roi Et. This is primarily a reflection of the differing industry structure in each province, and the varying sex ratios in different industries. In Khon Kaen, 45% of all employment is in textiles and mats, where (for all areas surveyed) the share of women in total employment is nearly 80%. In Roi Et, by contrast, half of all employment is in the food industries and repair services; the ratio of women to total employment in these two industries is only about 22%.

2.1.3.2 <u>Seasonal Variation in Employment</u>. There is considerable seasonal variation over the course of the year in employment in small-scale industries. The data from Table 5 indicate that during the 12 months previous to the survey, the minimum number of employed persons was 14,433, while the maximum number was 25,566. The survey data do not indicate the peak or trough periods of employment. However, data from the National Statistics Office indicate that employment in manufacturing and construction increases in the dry season while that in agriculture increases in the rainy season.

The variation in employment appears not only in agro-industries but also in other manufacturing enterprises as well (see Table 7). Employment in the industries of wood, bamboo, agricultural and related products and chemical products swing particularly widely during the year. The variation in employment in wood and agricultural processed products may be largely due to the seasonality of raw material supply. The wide variation in employment in the chemicals and chemical products industry is more difficult to explain. However, it is observed that in this industry the share of hired labor is as high as three-fourths of the total employment. Seasonal variations in employment in this industry may result from changes in the availability of hired labor over the year. On the other hand, the commerce section in which family labor is dominant and business depends little on seasonality, has the lowest variation in employment.

Turning to the question of seasonality of employment by province, there is an inverse relationship between the degree of seasonal variability in employment in urban manufacturing in a province and the average level of income per capita in

Table 7: Variation in Employment by Industries.

Industry	Maximum Employment (persons)	Minimum Employment (persons)	Ratio of Max./Min.
1. Agriculture, food and related products	5,171	2,674	1.934
2. Textiles and wearing apparel	5,965	3,526	1.692
3. Wood, bamboo, and cane products	4,727	2,217	2.132
4. Non-metallic minerals, including ceramics	1,050	660	1.591
5. Metal products	1,776	1,050	1.691
6. Chemicals and chemical products	493	240	2.054
7. Commerce	8,730	6,148	1.420
8. Services	5,091	3,209	1.586
9. Miscellaneous	1,271	823	1.479
Total	34,220	20,547	1.665

that province. One may hypothesize that this reflects the fact that, in Roi Et, the poorest and least developed of the provinces in the study, urban manufacturing is least well established; employment in towns is dependent on the seasonal availability of rural migrants. In Suphan Buri and Chiang Mai, by contrast, the industrial sector is based on a more stable urban labor force, and hence is less dependent on a seasonal inflow from the villages; as a result, the extent of variation in urban employment is smaller. Khon Kaen occupies an intermediate position in this regard. It will be interesting to test this interpretation using the more complete data to be collected in the Phase II survey.

2.1.4 Distribution of Economic Activity, by Firm Size. Table 8 presents information concerning the distribution of establishments and employment, by firm size. Among the major points emerging from this table are the following:

- Among manufacturing firms (all in the survey except the commerce sector, category 7), small firms- those with 6 or less workers- comprise over 80% of all establishments, and provide 44% of all jobs. Surveys or reports which exclude small producers are missing a substantial share of manufacturing production activity.

- In the case of commercial establishments, the preponderance of small firms is even greater: 90% of all enterprises and 70% of all employment was in firms with 6 or less workers.

Table 8: Distribution of Employment and Establishments, by Firm Size.

	No. of employed persons in firm					
	1	2-6	7-15	16-50	>50	Total
	No. of firms					
1. Food & processed ag. products	29	302	109	35	8	483
2. Textiles, garments	433	857	84	25	6	1,405
3. Wood, bamboo	39	405	85	35	10	574
4. Non-metallic minerals	3	44	26	15	3	91
5. Metal products	22	149	49	20	1	241
6. Chemicals	2	16	8	3	2	31
8. Services	136	585	152	32	3	908
9. Other	28	118	29	8	3	186
Subtotal	692	2,476	542	173	36	3,919
7. Commerce	245	1,705	170	28	2	2,150
Total	937	4,181	712	201	38	6,069

	Total Employment					
1. Food & processed ag. products	29	1,029	1,054	903	654	3,669
2. Textiles, garments	433	2,477	811	646	1,063	5,430
3. Wood, bamboo	39	1,128	812	877	1,071	3,927
4. Non-metallic minerals	3	151	235	314	243	946
5. Metal products	22	547	456	459	54	1,538
6. Chemicals	2	54	76	60	143	335
8. Services	136	2,057	1,448	791	179	4,611
9. Other	28	406	290	195	204	1,123
Subtotal	692	7,849	5,182	4,245	3,611	21,579
7. Commerce	245	5,436	1,548	691	116	8,036
Total	937	13,285	6,730	4,936	3,727	29,615

- At the opposite end of the scale, there were 36 manufacturing firms in the survey with 50 or more workers; these 36 employed over 3,600 workers, about 17% of the total labor force. This surprisingly low figure makes clear that there are relatively few large scale producers in provincial capitals and rural towns of Thailand, and the larger ones that do exist there are not really very large by national or international standards.[1]

- The sectors with the greatest preponderance of small firms are textiles (with over 50% of all employment in firms of 6 or less workers) and services (mostly repair shops, with 47% of all employment in small firms).

2.1.5 Work Place Characteristics. The survey asked for information concerning the nature of the work place: factory building, household, in the open air, etc. A question was also asked as to whether the firm used any power-driven machinery (i.e. machinery driven by electric, steam, water or wind power). The responses are summarized in Table 9, for all firms other than those engaged primarily in commerce. The following features stand out in this table:

- The majority of establishments did not use any power-driven machinery. On the other hand, the average size of the non-mechanized establishments was less than half that of the

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1. It should be noted; though, that in Khon Kaen a few very large firms were intentionally excluded from the survey.

Table 9: Phase I Town Survey: Work Place Characteristics: All establishments except commerce sector.

	With power-driven machinery			Without power-driven machinery		
	Establishments	Employment	Ave. employment per establishment	Establishments	Employment	Ave. employment per establishment
Factory compound with several buildings	45	1,879	41.8	9	102	11.3
Factory compound with one building	117	1,359	11.6	54	386	7.1
Factory compound with workshops and separate residence building	174	2,462	14.1	98	804	8.2
Workshop adjoining other workshop or buildings	770	4,031	5.2	594	2,201	3.7
Workshop connected to detached residence	167	1,591	9.5	95	556	5.9
Workshop in house	379	2,179	5.7	1,398	3,960	2.8
Outside	10	125	12.5	15	74	4.9
Total	1.660	13,626	8.2	2,263	8,083	3.6

mechanized producers. As a result, over 60% of all employment is in enterprises using power-driven machinery.

- Establishments operating outside (in the open air) are of negligible importance in the areas covered by this enumeration.

- For establishments not using power machinery, 56% of all employment was in workshops in the house or connected to a detached residence.

- For enterprises making use of power-driven machinery, the modal category was a workshop adjoining other buildings. Establishments within the house or connected to a detached residence accounted for only a little over a quarter of total employment.

2.1.6 Comparison with Alternative Data Sources. It is possible to compare the Phase I town survey results with information obtained from the Ministry of Industry. The latter data cover all factories registered with the Ministry, which by law should be any firm with seven or more hired workers, or using machinery with motors of two or more horsepower. The comparison cannot be very precise, since the Phase I survey also covered smaller firms, not required to register with the Ministry; on the other hand, the Ministry data include complete districts, rather than just the municipal areas covered in the Phase I survey. Finally, in Khon Kaen province, a few very large factories were excluded from the survey even though they are inside the municipal area.

The comparative data are presented in Table 10. The figures show large divergences between the two sets of information. In some cases, the Ministry of Industry figures are substantially larger, reflecting primarily the existence of large factories outside the municipal area (e.g. in Ban Phai and Nam Phong). In other cases, the Phase I survey results are much larger, presumably reflecting primarily the large number of producers too small to require registration by the Ministry (e.g. Chonnabot and Suphan Buri). On balance, one must conclude that the two data sources are not comparable enough to permit one to use either data source to assess the comprehensiveness or validity of the other.

There is also another source of information about manufacturing enterprises in Thailand; this is a study by the Department of Military Industry of the Ministry of Defense. The figures from this study are consistently lower than those of the Ministry of Industry: for the country as a whole, the Ministry of Industry reported 67,736 firms, while the Ministry of Defense reported only 37,360. In Khon Kaen district, the two sources reported 377 and 242 establishments, respectively. It is clear that the Ministry of Industry data are more comprehensive than those of the Ministry of Defense. We have made no further attempt to compare the Ministry of Defense statistics with those from the Phase I survey.

Table 10: Comparison of Phase I Survey Data with Statistics from the Ministry of Industry.

Areas	Phase I Survey Data		Ministry of Industry[1/]	
	Establishments	Employment	Establishments	Employment
Chiang Mai:				
Chiang Mai City	1,290	8,919	292	n.a.
San Kamphaeng	138	1,348	100	n.a.
San Pa Tong	60	589	121	n.a.
Khon Kaen:				
Khon Kaen City	490	3,734	377	5,016
Ban Phai	268	1,240	166	4,321
Chonnabot	639	1,514	25	103
Nam Phong	414	1,217	138	1,346
Roi Et:				
Roi Et City	257	1,444	130	690
Chaturapak Phiman	36	88	53	90
Suphan Buri:				
Suphan Buri City	212	1,262	92	286
Don Chedi	126	454	37	n.a.

n.a. not available

1/ Source: Provincial Offices of Industry, Ministry of Industry. All data refer to 1979.

2.2 Village Survey. As indicated previously, the Phase I village survey was undertaken in three stages: interviews with government officials, and examination of secondary data; interviews with village head men; and interviews with households. The results of only the second and third stages are discussed here.

2.2.1 Village Headman Survey. Before discussing the survey results, it may be worth reminding the reader that the villages chosen for interviewing were chosen using a purposive selection procedure; they cannot therefore be taken as providing as accurate representation of all the villages of the province. We shall return to this problem of generalizing from the survey results in section 2.4.1 below.

A summary of the survey results are presented in Table 11 (for non-farm characteristics) and Table 12 (for farm characteristics).

2.2.1.1 Non-farm Enterprises.[1] In view of the way the villages were chosen, it is perhaps not surprising that there are large reported numbers of non-farm enterprises. In 24 villages of Khon Kaen, for example, there were 3,633 households; in those households, the headmen reported 3,006 non-farm enterprises. This does not mean that 3,006/3,633 or 83% of all households in the survey in Khon Kaen had a non-farm enterprise, since several households had more than one such activity; but the numbers are still high, comprising a majority of all households surveyed in both Chiang Mai and

1. See discussion of this concept in Forward, p. ii.

Table 11: Phase I Village Survey, Eeadman Interviews: Non-farm Enterprises.

	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri	Total
No. of village enumerated	23	24	16	11	74
No. of households	3,095[a]	3,633	1,651	2,246	10,625
Present total population	12,770[b]	23,292	10,801[c]	12,307	59,170[d]
Major non-farm enterprises (number of households)					
Rice mills	44	78	22	5	149
Silk	38	817	147	-	1,002
Dress making, tailoring	189	90	21	-	300
Fish nets	-	125	-	-	125
Carpenters	348	402	155	68	1,009
Wood carving	180	-	-	-	180
Baskets	83	209	219	-	511
Bamboo products, mats	758	965	-	-	1,723
Bricks	78	-	-	-	78
Cement products	113	59	-	-	172
Blacksmiths	-	-	109	-	109
Machinery repairs	24	54	4	7	89
General store	88	118	47	33	286
Barber shops	-	-	9	-	9
Others	332	89	121	15	557
Total	2,275	3,006	854	128	6,299
Range in households per village:					
Smallest	50	37	43	61	37
Largest	297	372	184	313	372

a) 21 villages only
b) 19 villages, with 2,690 households
c) 15 villages, with 1,576 households
d) 69 villages, with 10,145 households

Table 12: Phase I Village Survey: Headman Interviews: Farm Characteristics.

(number of households)

	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri	Total
No. of households	3,095	3,633	1,651	2,246	10,625
Farm activities					
One crop paddy	1,504	3,002	1,523	1,008	7,037
Two crops paddy	490	506	-	1,147	2,143
Cassava	-	995	-	193	1,188
Vegetables	438	575	-	61	1,074
Soybeans	718	-	-	-	718
Tobacco	174	-	269	-	443
Kenaf	-	601	409	-	1,010
Water Melons	-	-	195	-	195
Other	625	1.423	76	75	2.199
Multiple Cropping	761	1.056	677	-	2.494
Livestock and poultry					
Pigs	1,804	281	185	190	2,460
Ducks	34	143	36	33	246
Fish	4	241	26	4	275
Water Supply					
Year-around Irrigation	885	850	30	1,147	2,912
Rain-fed	604	2,336	1,495	1,007	5,442
Power source					
Tractor	178	7	11	926	1,122
Water buffalo	2,536	2,737	1.535	949	6,757
Land Ownership					
Rent to others	163	75	10	69	317
Rent from others	436	223	40	832	1,531
Own no land	953	231	32	200	1,416
Cultivate no land	1,020	252	110	48	1,430
> 50 rai land owned	9	263	113	379	764
Hired workers (number of people hired)	1,187	2,000	972	4.066	8,225

Khon Kaen. In Suphan Buri, on the other hand, in spite of a conscious effort to find them, non-farm household enterprises were reported in only about 5% at all families.

As the table indicates, the most important enterprises reported were mats and bamboo products, carpentry and wood carving in Chiang Mai; mats and silk in Khon Kaen; and baskets, silk, and blacksmithing in Roi Et.

2.2.1.2 <u>Farm Characteristics</u>. It is not surprising to find that the most important crop in all areas of the survey is rice. Of the households which cultivate any land, over 99% grow some rice. Double-cropping of rice took place in more than half the households of Suphan Buri, and in a significant number of households in Chiang Mai and Khon Kaen. There was no double-cropping of rice in Roi Et.

This basic rice crop was supplemented by vegetables, soy beans, and tobacco in Chiang Mai; by cassava, kenaf, and vegetables in Khon Kaen; and by kenaf, tobacco, and water melons in Roi Et. In Suphan Buri, a few farms grow cassava and vegetables, but otherwise the production was concentrated solely in rice production.

It is interesting to find that nearly one third of the households in the sampled villages in Chiang Mai were reported to cultivate no land. The comparable figures were below 7% in Khon Kaen and Roi Et, and barely 2% in Suphan Buri. On the other hand, nearly 38% of the households in Suphan Buri rented land from others, while comparable figures for the other provinces are much lower. Onlv in Suphan Buri are there significant numbers of tractors (41% of all households). The percentage of farming households with year-around irrigation was 52% in Suphan Buri, 43% in Chiang Mai. 25% in Khon Kaen. and only 2% in Roi Et.

2.2.2 Village Household Survey. This survey involved interviews with 1,615 households in 33 villages. Some detailed results of this survey, village by village, are provided in tables 13-16, while summary measures are presented in table 17.

2.2.2.1 Chiang Mai. In the 12 villages surveyed in Chiang Mai, 689 households were interviewed out of a total of 1,961 (see table 13). 490 of those households grew rice; virtually all the rest cultivated no land at all, relying solely on non-farm household enterprises or work outside the farm household for their income. Of the 490 households growing rice, 285 had year-around irrigation. This was concentrated by village; in 7 villages, virtually every farm had year-around irrigation, while the other 5 villages had no irrigation at all.

With regard to the village labor force, of the 2,711 people of working age, over 75% worked at least part time in agriculture; over 50% worked in household non-farm activities; and nearly one quarter had paid employment outside the village. Clearly, a large number of these people had more than one job. The relative proportions among these three job categories

Table 13: Phase I Village Survey: Household Interviews: CHIANG MAI

Phase I code no.	1	2	3	4	5	6
Amphoe	Muang	San Kampang	San Kampang	San Kampang	San Kampang	San Kampang
Tambon	Mae-Huang	Buag Khang	Buag Khang	San Klang	Rong Wua Dang	Ton Pao
Village number	2	4	6	6	7	7
Total no. of households						
in village	113	74	208	79	129	177
in sample	54	40	106	20	41	95
Pop. of working age						
total	202	159	423	103	173	316
working in h.h. in agric.	122	115	316	99	131	228
working in h.h. in non-agric.	173	38	155	45	43	186
working outside village	61	32	120	52	38	54
Agriculture						
No. of households cultivating						
Rice	28	35	72	13	30	72
Cassava & kenaf	0	0	1	0	0	0
Other upland crops	6	3	28	6	31	0
Fruits & vegetables	11	17	45	18	28	0
H.H. with year-around irrigation	28	0	0	0	0	0
No. of tractors	28	1	6	2	24	20
No. of hired workers in agric.	45	3	41	1	126	5
Non-agric. household enterprises						
No. of hired workers	0	1	14	0	18	1
Major enterprises	bricks (25)	many small (21) none major	cotton weaving (11) baskets (10)	none	none	noodles (19) wood crafts (14) baskets (23)

Table 13. (continued 7, 8, 9, 10, 11, 12 and Total)

Phase I code no.	7	8	9	10	11	12	Total
Amphoe	San Patong	San Patong	San Patong	San Patong	San Patong	Hang Dong	
Tambon	Tung Satok	Tung Satok	Tung Satok	Ban Mae	Ban Kat	Nong Kwang	
Village number	2	6	11	10	4	7	
Total no. of households							
in village	51	147	338	232	298	115	1,961
in sample	16	73	68	64	89	23	689
Pop. of working age							
total	72	378	261	212	317	95	2,711
working in h.h. in agric.	68	296	246	174	256	57	2,108
working in h.h. in non-agric.	41	166	259	119	154	76	1,455
working outside village	2	105	51	62	73	11	661
Agriculture							
No. of households cultivating							
Rice	15	53	43	53	63	13	490
Cassava & kenaf	0	0	0	0	1	0	2
Other upland crops	14	52	45	54	27	7	273
Fruits & vegetables	9	19	17	51	66	12	293
H.H. with year-around irrigation	15	53	47	54	71	17	285
No. of tractors	7	7	9	31	53	15	213
No. of hired workers in agric.	0	761	497	43	596	100	2,218
Non-agric. household enterprises							
No. of hired workers	0	1	2	16	13	6	72
Major enterprises	mats (9)	knives (47)	baskets (64)	wooden handicrafts (37)	many small (37) none major	pottery (23)	

Table 14: Phase I Village Survey: Household Interviews: KHON KAEN

Phase I code no.	1	2	3	4	5	6
Amphoe	Muang	Muang	Muang	Muang	Ban Pai	Chonabot
Tambon	Samran	Ban tum	Sawatee	Muang kao	Kok Samran	Chonabot
Village name	Koke	Moung(?)	Nong taki	Ban Ped	Kok Samran	Don Kao
Total no. of h.h.						
in village	238	192	200	206	232	52
in sample	48	39	63	64	50	18
Pop. of working age						
total	220	160	312	310	222	89
working in h.h. in agric.	148	110	223	219	211	83
working in h.h. in non-agric.	24	10	127	60	101	31
working outside village	43	30	52	82	3	13
Agriculture						
No. of households cultivating						
rice	45	38	58	59	47	18
cassava & kenaf	5	4	6	2	42	0
other upland crops	6	10	39	40	4	0
fruits & vegetables	35	5	40	8	32	17
H.H. with year-round irrigation	33	0	0	1	0	0
No. of tractors	3	0	0	2	28	0
No. of hired workers in agric.	37	3	42	60	320	45
Non-agric. household enterprises						
No. of hired workers	2	0	0	1	5	0
Major enterprises	several, none major	None None	Silk (24) baskets (44)	Silk (33)	Cotton (30) weaving Mats (40)	Silk (18)

Table 14. (continued 7, 8, 9, 10 and Total)

Phase I code no.	7	8	9	10	Total
Amphoe	Chonabot	Nam Pong	Nam Pong	Nam Pong	
Tambon	Chonabot	Nam Pong	Wong chai	Ta Krasurm	
Village name	Makambaei	Kok soong	Wong Toa	Ta Krasurm	
Total no. of h.h.					
in village	37	129	38	183	1,507
in sample	14	40	21	61	418
Pop. of working age					
total	63	186	68	343	1,973
working in h.h. in agric.	46	107	57	230	1,434
working in h.h. in non-agric.	21	93	55	105	627
working outside village	9	40	22	43	337
Agriculture					
No. of households cultivating					
rice	11	24	8	61	369
cassava & kenaf	0	18	10	4	91
other upland crops	1	13	1	31	145
fruits & vegetables	9	6	14	51	217
H.H. with year-round irrigation	0	1	1	59	95
No. of tractors	0	12	1	5	51
No. of hired workers in agric.	12	26	53	229	827
Non-agric. household enterprises					
No. of hired workers	0	5	3	1	17
Major enterprises	Silk (14)	Mats (34)	Pottery (18)	Silk (43) Mats (19)	

Table 15: Phase I Village Survey: Household Interviews: ROI ET

Phase I code no.	1	2	3	4	5
Amphoe	Muang	Muang	Muang	Muang	Muang
Tambon	Pa Pha	Nua Muang	Saad Somboon	S.S.	S.S.
Village name	Ban Pone	Nong Bua Tong	Ban Sang	Don Keng	Pa Poem
Total no. of h.h.					
in village	75	101	180	68	54
in sample	17	32	57	25	15
Pop. of working age					
total	83	184	255	104	73
working in h.h. in agric.	61	71	236	74	58
working in h.h; in non-agric.	48	84	27	10	40
working outside village	31	23	45	26	5
Agriculture					
No. of households cultivating					
rice	14	20	56	21	14
cassava & kenaf	0	2	18	16	10
other upland crops	10	13	22	12	8
fruits & vegetables	10	1	19	0	1
H.H. with year-round irrigation	0	1	0	0	0
No. of tractors	0	1	1	0	0
No. of hired workers in agric.	18	34	33	84	10
Non-agric. household enterprises					
No. of hired workers	0	11	0	0	0
Major enterprises	Rice containers (13)	Knives (22)	Baskets (8)	None	Baskets (13)

Table 18 (continued 6, 7, 8, and Total)

Phase I code no.	6	7	8	Total
Amphoe	Chatu	Chatu	Chatu	
Tambon	E-Ngong	E-Ngong	Nong-Pue	
Village name	Suan Mon	E-Kote	Ka-Yai	
Total no. of h.h.				
in village	101	n.a.	184	763[a)]
in sample	44	31	57	278
Pop. of working age				
total	210	132	223	1,264
working in h.h. in agric	201	103	201	1,005
working in h.h. in non-agric.	67	33	5	314
working outside village	28	31	49	238
Agriculture				
No. of households cultivating				
rice	43	26	54	248
cassava & kenaf	4	0	13	63
other upland crops	4	0	0	69
fruits & vegetables	11	0	3	45
H.H. with year-round irrigation	0	0	1	2
No. of tractors	0	0	0	2
No. of hired workers in agric.	46	26	41	292
Non-agric. household enterprises				
No. of hired workers	37	10	3	61
Major enterprises	Silk (21) Ox carts (22)	Salt (10)	None	

a) 7 villages only

Table 16: Phase I Village Survey: Household Interviews: SUPHAN BURI

Phase I code no.	2	3	4	Total
Amphoe	Don Jedi	Don Jedi	Don Jedi	
Tambon	Rai-rot	Rai-rot	Rai-rot	
Village name	Rai-rot	Nong-jik-	Nong-jaeng	
Total no. of h.h.				
in village	231	261	150	642
in sample	94	81	55	230
Pop. of working age				
total	378	339	238	955
working in h.h. in agric.	328	311	200	839
working in h.h. in non-agric.	18	9	15	42
working outside village	20	19	68	107
Agriculture				
No. of households cultivating				
rice	85	73	50	208
cassava & kenaf	0	4	14	18
other upland crops	3	12	11	26
fruits & vegetables	9	16	4	29
H.H. with year-around irrigation	80	41	0	121
No. of tractors	75	57	20	152
No. of hired workers in agric.	1,362	1.767	301	3,430
Non-agric. household enterprises				
No. of hired workers	0	0	10	10
Major enterprises	None	None	None	

Table 17: Summary Measures, Phase I Village Household Survey.

	Chiang Mai	Khon Kaen	Roi Et	Suphan Buri	Total
FMPHH	5.1	6.1	6.5	5.5	5.7
PWA	4.2	5.0	5.2	4.2	4.5
AFS	7.7	23.1	22.2	31.6	19.3
AFSPC	1.5	3.8	3.4	5.8	3.4
AFSPW	1.9	5.2	4.8	8.0	4.6
AFS'	9.1	24.2	n.c.	33.7	21.0
AFSPC'	1.9	4.0	n.c.	6.2	3.7
AFSPW'	2.3	5.5	n.c.	8.5	5.0
IRRIG	58%	20%	n.c.	55%	39%
FENFE	2.9	2.1	2.4	0.0	2.0
FEOHH	1.0	1.1	1.2	0.9	1.0
FEOV	1.0	0.8	0.9	0.5	0.8

Definitions:

FMPHH: Average number of family members per household.
PWA: Population of working age (11-65).
AFS = Average farm size, in rai. (1 Rai = 0.395 acres = 0.16 hectares).
AFSPC = Average farm size per capita.
AFSPW = Average farm size per worker (per person of working age, 11-65 years old).

The primed variables refer only to households which cultivate land.

IRRIG: Percentage of households with year-around irrigation.
FENFE: Family employment in non-farm enterprises: This is the number of family members working in non-farm activities within the household.
FEOHH: Family employment outside the household. This is the number of family members with paid employment outside the household, whether inside the village or outside.
FEOV: Family employment outside the village. This is the average number of family members with paid employment outside the village (a component of FEOHH).

differed widely from place to place; in village 2, there was relatively little non-agricultural work, while in several other villages the number of people engaged in non-agricultural pursuits was substantially larger than the number involved in farm activities. It is interesting to note that, in these villages taken together, the number of hired agricultural workers exceeds the number of family members working in agriculture. This is particularly true in villages 8, 9, and 11, where hired workers were more than twice the number of family workers in agriculture. In some other villages the hiring of workers in agriculture seems not to be practiced at all.

In terms of non-farm activities, villages were chosen for the survey to include a diverse range of products. In general, the villages are quite specialized in one or another type of activity with relatively few villages engaged in substantial numbers in a variety of different product lines. Although these activities provide employment to large numbers of family members, reliance on hired labor in household non-farm enterprises is negligible.

2.2.2.2 Khon Kaen. 418 households were interviewed out of 1,507 in the 10 surveyed villages of Khon Kaen (see table 14). There were relatively few households in this group which cultivated no land, and these were concentrated primarily in 2 villages of Nam Phong (8 and 9), each of which has extensive non-farm activity (mats, and pottery). Of the total population of working age in these ten villages, 73% were engaged in agricultural work, 32% in non-agricultural household activities, and 17% in paid employment outside the village. All of these percentages are below those of Chiang Mai, the latter two figures substantially so. The number of paid workers hired by these villagers to help in their agricultural work was significant in only two villages, and in the aggregate was smaller than in Chiang Mai relative to the number of family members working in agriculture. Again we find substantial specialization by village in non-agricultural pursuits, and virtually total reliance on household (non-hired) labor in this type of activity.

2.2.2.3 Roi Et. 278 households were interviewed in 8 villages of Roi Et, including 5 in the district of the provincial capital (Amphoe Muang) and three in a poorer district 40 kilometers south of the capital (see table 15). In only one of those villages are there significant numbers of people who do not grow rice (village No. 2, where a significant numbers are engaged in making knives). There were virtually no families with either year-around irrigation or tractors. The labor force is heavily concentrated in agricultural work, with only 25% engaged in household non-farm activities, and less than 20% working as hired laborers outside the village. Such non-farm household enterprises as exist are again concentrated by village, and rely only to a limited extent on hired workers (approximately 20% of the labor force of such enterprises).

2.2.2.4 Suphan Buri. In this province only three villages were enumerated (see table 16), with 230 households. In one of these villages, nearly all farms were irrigated, and used tractors; a second had no irrigation, and few tractors, while the third village was mixed. The reported number of household non-farm enterprises was negligible. The village labor force is overwhelmingly engaged in agriculture, although some 10% had work outside the village.

2.2.2.5 Comparisons Among the Four Provinces. Table 17 presents comparative data for the four provinces covered by the survey. These summary measures indicate a considerable diversity among the areas studied.

2.2.2.5.1 Family Size. Average family size ranged from 5.1 members in Chiang Mai to 6.5 in Roi Et. It may be that the smaller family size in the richer provinces reflects a conscious decision on the part of parents in those provinces to limit the number of their children. An alternative explanation is also consistent with the data, however. Family size as measured here refers to the number of people living in the household at the time of the survey; thus, the smaller measured family size in Chiang Mai and Suphan Buri might reflect not the fact that parents in those provinces have fewer children, but that more of the children in those provinces leave home, as a result of either higher population pressures on the land or more readily available opportunities to migrate. It will be possible to explore these alternative interpretations more carefully using the detailed data of Phase II.

2.2.2.5.2 Farm Size and Irrigation. The variation among provinces in average farm size is also striking: from an average of only 7.7 rai per household in Chiang Mai to 31.6 rai in Suphan Buri with Khon Kaen and Roi Et in intermediate positions (22-23 rai per household), on the average. With regard to the availability of irrigation, on the other hand, this is much more prevalent in Chiang Mai and Suphan Buri; in the two provinces of the North-East, only a small percentage of households had access to year-around irrigation water.

2.2.2.5.3 Family Participation in Non-Agricultural Activities. Table 17 indicates that, for the whole study area, an average of one person per household was engaged in paid employment outside the household. There is relatively little variation around this average among the four provinces: somewhat higher in Roi Et, somewhat lower in Suphan Buri. As a percentage of household population, the variation among provinces is even smaller (ranging from 21.4% in Suphan Buri to 23.8% in Chiang Mai).

If we restrict our attention to paid employment outside the village, the variation among provinces is somewhat larger, ranging from somewhat less than 0.5 persons per average household in Suphan Buri to nearly 1 person per household in Chiang Mai. The largest range between provinces, however, concerns the extent of family participation in household non-agricultural enterprises. This measure is highest in Chiang Mai (an average of 2.9 persons per household); is somewhat lower in Roi Et and Khon Kaen (2.4 and 2.1 persons per household, respectively); and is virtually zero in Suphan Buri.

2.2.2.5.4 Overall Comparisons. Taking these various characteristics together, the following overall picture emerges:

-- In Suphan Buri, the average farm size is large; 55% of all farms in the survey have irrigation, and the quality of the land is good. Agricultural incomes are high, and the pressures to find alternative sources of income are relatively weak. Non-farm activities within the village household are virtually non-existent, and paid employment outside the household the lowest of the four provinces studied.

-- In Chiang Mai, the average quality of the land is also good, while more than half the farms are served by year-around irrigation; but although average family size is small, average farm size is less than one fourth of what it is in Suphan Buri. There is significant pressure to find alternative sources of income, to supplement what can be earned in the efficient but overpopulated agricultural sector. In the villages surveyed, this takes the primary form of non-farm activities within the rural household; an average of 2.9 persons per household were engaged in such activities. When combined with family members employed outside the household, one finds a total of 3.9 persons per household, in an average family of 4.2 persons of working age. The first of these figures includes some double-counting, since one person may be engaged in non-farm activity at the same time that he has a paid job outside the household. Still, the figures are impressive; there is a strikingly large amount of non-agricultural activity, primarily in the form of non-farm enterprises within the rural household, in the area surveyed in this province.

-- The two provinces of the North-east present yet a third picture. The average farm size, while not as large as in Suphan Buri, is approximately triple the level in Chiang Mai; but the quality of the land is lower, and the availability of year-around irrigation much smaller. The pressures to find alternative supplementary sources of income are thus also very strong in these two provinces. In the villages surveyed, the result is a level of employment in household non-farm enterprises which, while not as high as in Chiang Mai, is still quite significant. In addition, the level of paid employment outside the household is the highest of any of the provinces covered in the survey. If the resulting level of income per capita in these villages is still well below that of Chiang Mai-- a presumption to be tested in Phase II, since the Phase I survey collected no information on income levels--it must be attributed to three factors:

-- although average farm size is much larger in the North-east, land quality and the availability of infrastructure (particularly irrigation) is so much lower that agricultural income per capita is lower;

-- although non-agricultural work both inside and outside the household is substantial in both Chiang Mai and the North-east, such work provides more jobs per household, and (probably even more important) more productive (i.e. more highly paid) jobs in Chiang Mai; and

-- family size is significantly larger in the North-east, so any given family's income is shared among a larger number of claimants.

2.2.3 Comparison of Alternative Data Sources Concerning Village Enterprises. It has been possible to evaluate the Phase I Village Survey data in two different ways.

2.2.3. NSO Data. For ten villages, the results of the Phase I Survey can be compared with information from the National Statistical Office. The latter data are taken from worksheets summarizing a variety of NSO surveys, kindly shared with us by the Provincial NSO Offices. The results of this comparison are shown in Table 18. On the whole, one might

Table 18: Comparison of Phase I Village Survey Results with NSO Data.

	Village ID No.	No. of households participating in non-agricultural enterprises, as reported in			Major non-farm entarprises	
		Headman Survey	Household Survey	NSO Data	Enterprises, as reported by NSO	No. of firms in that enterprise, as reported in Headman/Household Survey
Roi Et	1	77	75	50	Bamboo prod's	75/70
	2	100	84	80	Blacksmiths	95/66
	3	27	33	170	Not specified	-
	4	8	12	69	" "	-
	5	60	42	0	" "	-
	6	91	48	0	Silk	80/42
					Ox carts	50/44
	8	30	9	0	Not specified	-
Khon Kaen						
	5	273	360	0	Bamboo, mats	200/200
	6	58	54	0	Mats	0/0
	7	46	42	0	Not specified	-

say that the agreement is quite good in two villages (Roi Et Villages 1 and 2); is fair in two others (Roi Et Village 6 and Khon Kaen village 5): and is almost nonexistent for the other six villages.

2.2.3.2 <u>Comparison of Headman and Household Surveys</u>. The data have been compiled in such a way as to permit a comparison of results obtained in headman and household surveys. This was done as follows. For each village, a list was compiled showing the reported number of households engaged in each type of enterprise. For the household survey, these data were multiplied by the inverse of the sampling fraction, to get an estimate of the total village populations. Table 19 shows an aggregation of these data.

In terms of overall numbers, the household survey reported more non-farm activities than the head man survey in Chiang Mai, Khon Kaen, and Suphan Buri; in Roi Et, the head men reported a larger total. In terms of total numbers, the overall agreement between the two surveys is quite close. When one looks at the village and enterprise detail, however, more differences emerge. If we believe that the household survey is accurate, then the head man responses missed about one third of the household enterprises, while nearly 30% of the enterprises they did report are incorrect. Alternatively, if we believe that all household enterprises reported by either survey actually does exist, so that each one is accurate but incomplete, then this

Table 19: Comparison of Phase I Village Headman with Household Survey Data.

	Number of Households Engaged in Non-Farm Enterprises, According to:		Common to both (in same same village and enterprise)
	Headman Survey	Household Survey	
Chiang Mai	1,022	1,209	710
Khon Kaen	1,260	1,289	908
Roi Et	393	303	264
Suphan Buri	21	51	18
Total	2,696	2,852	1,900

would imply that the headman survey missed 27% of all household enterprises, while the household survey missed 22%.

There is no consistent pattern of difference between the two surveys, by enterprise type.

On the whole, one might conclude that the agreement between the two data sets is fairly close, although not entirely in agreement. In view of the ways in which the data were collected, it seems clear that the household survey is the more accurate of the two. Most of the follow-up analysis has put primary reliance on this source of in formation.

2.3 Linkages.

2.3.1 Linkages Between Agricultural and Non-Agricultural Activities in Village Households. From the survey data, it was found that 923 households or 58.7 percent of all households in the survey had both agricultural and non-agricultural enterprises operated by their household members; 571 households or 36.3 percent had agricultural production only; and 79 households, or 5.0 percent, had non-agricultural production only. Additional observations from households with both agricultural and non-agricultural enterprises highlights some of the linkages between agricultural products and non-agricultural enterprises. Mulberry is used for silk production, while bamboo is required for basket making. On the other hand, some farmers who are engaged in blacksmithing also use the outputs-shovels or knives-for agricultural production. Some farm households invested in non-agricultural enterprises using the savings from agricultural production, while others invested in agricultural production using savings from other activities. One important topic to be examined in the Phase II studies concerns the allocation of labor and other resources between agricultural and non-agricultural activities within households engaged in both.

Among the 571 households with agricultural production only, 58.8 percent have farms of more than 10 rai; and only 8.4 percent have farms of 5 rai or less. Among 79 households with only non-agricultural enterprises, 63.3 percent do not own any farm land; and almost all of this group own farm land of less than 5 rai. This information suggests that farm size may be reflected in enterprise operation of rural households. Beyond this, it was found that, in some villages, most households have both farm and non-farm enterprises while other nearby villages with similar resource endowments do not have any significant non-farm enterprises. Such cases require other explanations besides farm size. It is hoped to explore these questions in more detail in Phase II.

2.3.2 Linkages Between Villages and Towns. During the course of the village and town surveys, a number of different linkages were found between village and town producers. These linkages arise in both product and labor markets. In the product markets, firms in town purchase commodities made in the villages to be used as inputs in the production process. Fruit, vegetables and meat for processing and silk thread made in villages for weavers in towns are examples of this type of linkage. On the other hand, there are a number of products produced in towns which are purchased by villagers either for household consumption (simple furniture, some processed foods) or for use in production (implements, fish nets).

It was found that some products are produced in both towns and villages. Silk weaving is an obvious case in point. Although the products are somewhat different in type and quality, they are competitive to some extent. Mats, agricultural tools, processed foods and tailoring were likewise found in villages as well as in towns.

The mobility of labor between towns and villages provides another type of linkage. As already indicated, it was found that a substantial number of village household members have paid jobs outside their villages. Discussion with villagers suggests that many villagers worked in towns close to their villages, particularly in Chiang Mai City and Khon Kaen City; some of them had jobs in Bangkok, far distant from their villages; some villagers found work in towns during the slack period of agriculture. Such rural-urban migration was also found in other studies of the labor market (NSO, Charsombut, Chindasaeng).

The case of rural to urban migration in usually discussed negatively among administrators in Bangkok. On the other hand, the survey suggests that there is a widespread system of subcontracting by town firms to householders living and working in the villages. Ready-made garments, wood crafts, and metal bowls are produced using this system in the North; silk weaving and fish net making follow the same pattern in Khon Kaen. This pattern of subcontracting will be subject to further study during Phase II of the project, to determine how it can be encouraged to generate more productive employment in rural areas.

2.4 Limitations and Problems.

2.4.1 Problems of Generalizing Phase I Results. Neither the villages nor the towns included in the Phase I surveys were chosen on a random basis. As such, there is no way of generalizing the results of that survey to get precise measures which are statistically representative of whole districts, provinces, or regions.

On the other hand, provinces, towns and villages were selected in such a way as to reflect different typologies known to exist in the country. Roi Et was chosen because it is representative of the very poor provinces of the North-East: virtually no irrigation, relatively poor land quality, little non-farm household activity. Khon Kaen is a more developed province in the same poor region, with a growing urban center, somewhat more irrigation and non-farm activity in villages, but still poor compared to the country as a whole. Chiang Mai is a province known for its extensive non-farm activities, with higher population density but more irrigation. Suphan Buri was included in the study in order to provide contrasts between the other provinces and an area of extensive irrigation, multiple cropping, and increasing agricultural mechanization. Within each of these provinces, towns and villages were selected for study which are to some extent representative in terms of a variety of socio-economic characteristics: for towns, the size, the nature of the surrounding area, and the economic ties to the hinterland and to the provincial capital; for villages, the types of agricultural patterns followed, the types of non-farm enterprises in the village, and the extent to which its people find paid employment outside the village. Thus, even though it is not possible in a statistical sense to "blow up" these results to get estimates for whole provinces or regions, still the results are in a fundamental sense representative of the different town and village systems which exist in these areas.

2.4.2 <u>Problems of Data</u>. The follow-up in towns in Phase II has provided an opportunity to work in more detail with the Phase I questionnaires. In the course of doing so, it has been possible to gain some insights into the strengths and weaknesses of those data. Perhaps the most important problem which has emerged is that, in Phase I, each firm was classified into one single economic enterprise group. In fact, though, many firms are engaged in a variety of different activities: rice milling, cassava processing and kenaf baling all take place in one firm, for example, while many establishments produce a limited set of products (e.g. doors and windows, or cement blocks) while selling a much larger range (e.g. all types of building supplies). Employment in such firms, as reported in the survey results, includes total employment in all the firm's diverse activities; this number is then classified under a single enterprise code (the most important one for that firm). The result is that employment figures as well as information on numbers of establishments are not as precise as one might have hoped. In general, though, the further work of Phase II to data has not changed the basic picture drawn from the Phase I survey

III. CONCLUSIONS

The main purpose of the Phase I Survey was to provide information needed for Phase II of the Project. As such, it has clearly fulfilled its function. In the villages, the information in Phase I provided the framework for the selection of both villages and individual households for the more detailed and comprehensive Phase II surveys now under way. The stratification of households for the follow-up work--both in terms of specification of strata which are appropriate and in terms of household lists within each of these strata--were derived directly from the Phase I Survey. In towns, the Phase I enumeration provided a detailed listing of all firms, by enterprise, in each town covered, as well as considerable information about the characteristics of each firm. Again, that information has proven invaluable in the selection of particular enterprises and firms for further study.

In addition to this function as background for the Phase II Survey, the Phase I data have provided important information concerning the pattern of agricultural activities in the areas studied, as well as the types of non-agricultural pursuits in which village and rural town households are engaged. It is expected that there will be other follow-up reports doing further analysis of these data (including, among others, a study of the village household data on off-farm employment, using multiple regression analysis, as well as further analysis of the data on the seasonality of employment in towns).

It is hoped that the results of the Rural Off-Farm Employment Assessment Project--in this report, in the additional analyses of Phase I data, and in the more detailed follow-up work to be done in Phase II--will lead to a greater understanding of the significance of rural off-farm enterprises, and a further interest in the potential and needs of people in this important area.

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