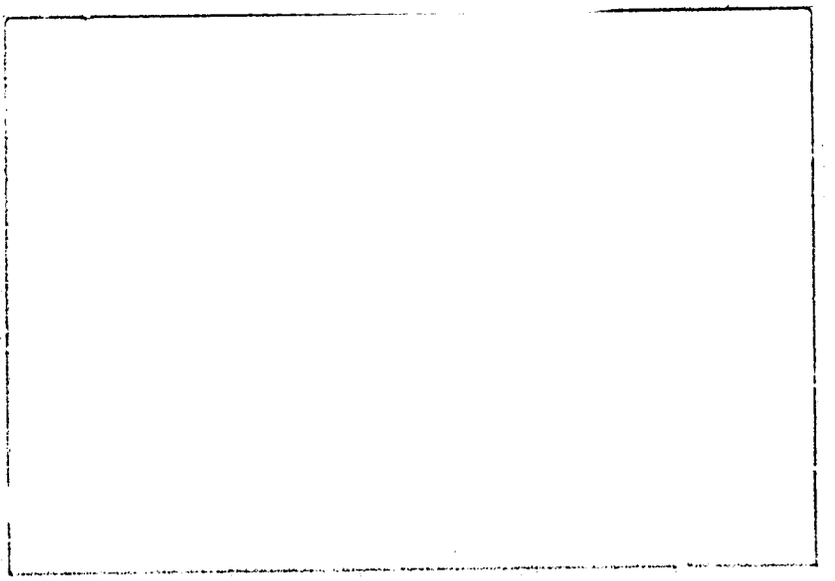
STUDIES IN RURAL FINANCE



AGRICULTURAL FINANCE PROGRAM

Department of Agricultural Economics and Rural Sociology

THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO
43210

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FINAL REPORT
RURAL FINANCIAL MARKETS--
RURAL OFF-FARM EMPLOYMENT PROJECT
THAILAND

Prepared by

Richard L. Meyer
May, 1983

Department of Agricultural Economics
and Rural Sociology
The Ohio State University
Columbus, Ohio
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BACKGROUND

In October 1977, the Department of Agricultural Economics and Rural Sociology entered into Cooperative Agreement No. AID/ta-CA-1 under the Basic Memorandum of Agreement AID/ta-BMA-7 with the Agency for International Development. Applied research and consulting on rural financial market problems and policies was one of the four types of interrelated technical services to be provided under the project. In 1977 and 1978, Department faculty traveled to Thailand to analyze rural financial issues and discuss possible projects with USAID and RTG (Royal Thai Government) officials. The AID Project Manager (Dr. Clifton Barton) accompanied Department faculty on some of these trips. A general overview paper on rural financial markets in Thailand was prepared at the request of USAID during one of these visits (Meyer, Baker and Onchan).

Parallel with these developments, Michigan State University signed a Cooperative Agreement with AID for work on Rural Nonfarm Employment with Dr. Barton also as Project Manager. MSU staff discussed possible work in Thailand with USAID and RTG officials. USAID/Bangkok concluded that it would support a Mission funded project focusing on rural

employment, and requested that OSU and MSU provide technical assistance to the project.

PROJECT OBJECTIVES

OSU support to USAID/Bangkok was formalized through the Cooperative Agreement No. AID/ta-CA-4, dated September, 1979. This Agreement provided that $195,013 of the funds provided by AID to AID/ta-CA-1 would be allocated to this Cooperative Agreement and the OSU share would be $13,872. Arrangements were likewise made with MSU to cover its participation in the project.

OSU agreed to provide the services of Richard L. Meyer in Thailand for a maximum of two years. His primary responsibility would be to work on the USAID/Thailand Rural Off-Farm Employment Project with some additional responsibilities related to the Rural Financial Markets general Cooperative Agreement (Appendix A). The services Dr. Meyer was expected to provide to the Employment Project were identified as follows:

1. He will assist Kasetsart University staff in designing and implementing field surveys relating to rural financial markets, farm household credit use and labor supply, and financial aspects of rural nonfarm enterprises.

2. He will provide advice to the researchers at Kasetsart University on methods of processing and analyzing the data generated in these areas, and will assist in analyzing results of field surveys and preparing final reports.

3. Where appropriate, he will help to identify U.S. and non-U.S. consultants to be funded by Ohio State University through existing cooperative agreement funds and/or other sources. These consultants will assist in rural household surveys and financial market studies.

4. In addition, he will provide advice to the Mission on ways of designing projects and policies that improve the performance of rural financial markets in servicing agricultural and nonfarm enterprises.

Dr. Meyer began full-time work in Thailand in September, 1979. In June, 1980, he was requested to return to OSU to interview for the position of Director of International Programs. He was asked to take that position. In discussions with OSU, AID, USAID and RTG officials, it was agreed that he would return to OSU in February, 1981, but continue to contribute to the project as time permitted. He returned to Bangkok to participate in a project conference in June 1981, and spent an additional two weeks at Kasetsart University in September, 1982, helping prepare for the final project conference.

The original duration of AID/ta-CA-4 was set at 24 months. Cost savings permitted it to be extended until December 31, 1982. Dr. Meyer carried a 20% salary appointment on this project until March 30, 1982. Dr. Yongyuth Chalamwong was brought to OSU, partly at Cooperative Agreement expense, as a Visiting Professor in June, 1982, for one year to extend and expand the research being conducted by other researchers at MSU and in Thailand.

RURAL OFF-FARM EMPLOYMENT ASSESSMENT PROJECT

The work conducted under this Cooperative Agreement cannot be understood and evaluated without considering the overall context in which it was conducted. During 1978 and early 1979, representatives from AID, OSU and MSU worked with USAID/Bangkok and RTG officials to design what eventually became the Rural Off-Farm Employment Assessment Project (ROFEA). In May 1979 USAID and the RTG signed an agreement to fund a two-year project. The final arrangements were completed by August, 1979.

ROFEA objectives were to provide data and analysis needed to identify and develop appropriate projects and policies to assist in the expansion of nonfarm employment and income opportunities in the rural areas and market towns of Thailand. Information and recommendations developed through the project were expected to be used by RTG and international agencies. Conferences and workshops would be held to disseminate the results of the project.

The project was divided into three components designed to analyze problems of rural nonfarm enterprises, farm households and rural financial markets. Research Paper No. 1, listed in the project publications list (Appendix B), describes the expected analysis in detail. A complete program of information dissemination was also planned.

The primary implementing agency was the Center for Applied Economics Research, Kasetsart University, Bangkok.

The Center obtained additional assistance from Khon Kaen and Chiang Mai Universities. OSU and MSU were identified to provide technical assistance to the project.

ROFEA was originally scheduled for a two-year period. Subsequently, it was extended until September, 1982.

During the first several months of the project, the total team of Thai and foreign researchers worked as a group with individual responsibilities defined only in general terms. Eventually efficient administration required a sharper division of labor for the senior staff. After a good deal of discussion among ROFEA and USAID staff, it was agreed that Dr. Tongroj Onchan, Project Director, would coordinate the finance component, in addition to providing overall leadership and direction to the project. Dr. Don Mead, MSU, would coordinate research related to the non-farm firms. Dr. Meyer would coordinate the farm household research. For this reason, the rest of this report largely concerns the farm-household research conducted by ROFEA.

FARM-HOUSEHOLD RESEARCH

Data Collection and Processing

A combination of purposeful and random sampling procedures were used to obtain a sample of 424 farm households for the research (Research Paper No. 3). Data were collected from these households on a weekly and monthly basis for a full year. The data included information on

time allocation by household members, inputs and outputs of farm and nonfarm enterprises, household capital stock, sources and uses of funds, and farm and household characteristics. The equivalent of 6-7,000 IBM cards of data were collected and processed each week.

Data Analysis

The data were analyzed largely by junior and senior staff of Kasetsart, Khon Kaen and Chiang Mai Universities, and three Ph.D. candidates studying at Purdue, OSU and MSU. During 1980, the design of the individual pieces of analysis was conducted in Thailand by the researchers in consultation with senior project staff. Some of the analysis was completed in Thailand. Some was completed in the U.S. by the Ph.D. students. The results have been reviewed in formal and informal meetings in Thailand and the U.S.

Dissemination of Results

The results of this research have been widely distributed. A conference reporting preliminary results was held at Kasetsart University in November, 1980. A second Kasetsart conference was held in June, 1981. A more formal conference was held in September, 1981, in Pattaya. It included key Thai decisionmakers and summarized all research findings available at that date. The final ROFEA conference was also held in Pattaya on September 18-19, 1982. This

conference was also for key Thai decisionmakers. Informal workshops have been held at MSU at which the researchers from Purdue, OSU and MSU have exchanged findings. A seminar is being planned for May, 1983, for presentation of the key farm-household findings to interested persons from AID and other agencies in Washington, D.C.

The publications list in Appendix B identifies the several publications prepared by project researchers. Copies of these publications have been widely distributed by Kasetsart University. Representatives of several international agencies have consulted with Dr. Onchan and other researchers in Thailand about the findings, and have invited them to present the results in meetings and conferences in and out of Thailand. Dr. Onchan has been very active in discussing the research in several meetings.

Future Uses of the Research and Data

A number of discussions have been held with Dr. Onchan and others about the future use of the research results and some of the project data. Two specific possibilities are being discussed in the U.S. One concerns analysis of the relationship between household fertility and off-farm employment, and the other involves World Bank interest in land tenure.

A major investment of OSU and Dr. Chalamwong during the past few months has been the systematic documentation of the

data and the preparation of a user's manual. This effort will greatly increase the facility with which future researchers can access the data.

More analysis will undoubtedly be conducted. At OSU, papers are in preparation concerning off-farm labor supply and the efficiency of part-time farming. Other uses are being made of the data in the research program at Kasetsart University. Plans are being made to continue collaborative research with Dr. Chalamwong after he returns to Thailand.

PRINCIPLE FARM-HOUSEHOLD RESEARCH FINDINGS

A complete concise summary of the farm-household research findings is not yet available for the project. Some of the principle findings are highlighted below. They are grouped under some of the main areas of research completed, and are presented without reference to the individual authors whose work contributed to this summary.

Farm-Household Finance

1. Farm-households have complex and heterogeneous patterns of cash and income flows. Much of the cash income received by farm-households comes from nonfarm enterprises and off-farm work. A large share of farm income is derived from the value of own-production consumed in the home. Cash receipts from farm enterprises are

frequently quite lumpy and seasonal. Receipts from off-farm work and nonfarm enterprises are somewhat more evenly spread out over the year.

2. At the beginning of the survey year, only 42 percent of the sampled farm-households reported outstanding loans from all sources. Loans from institutional sources represented 7 percent of the value of loans outstanding. Farmers reported that 50 percent of the amount of funds borrowed were used to purchase assets. The remainder were about equally divided between operating expenses and consumption. Indebtedness was not great relative to the value of assets. Only nine or ten households in the entire sample of 424 farms were potentially insolvent.
3. The farm-households reported only modest amounts of new borrowing during the year. In Chiang Mai, for example, only 22 of the 155 households analyzed borrowed 500[1/] or more per household during the year.
4. Consumption expenses showed great variation during the year. Peak levels of consumption expenditures usually occurred after the wet season harvest when households have greater levels of liquidity and when many of the national religious and other holidays are celebrated.
5. Few households reported holding financial assets at the beginning of the year, and there was little buying and selling of such items during the year. Few households

1/ The currency in Thailand is the baht with approximately 20 baht equal to $1.00 during the survey year.

had checking or saving accounts in formal institutions. The total value of all current assets, including financial assets, averaged only 20,000 per household at the beginning of the year. This represents 17 percent of all assets. There was a tendency for many households to experience cash surpluses in many months. Since these surpluses were not offset by reports of capital purchases, consumption or financial deposits, it must be assumed that cash was accumulating during the year.

6. The above findings suggest that many households would have benefitted by a rural savings mobilization program. There appear to be financial resources in villages that could be mobilized through innovative savings programs. A few experiments by banks to mobilize village savings have produced promising results.

7. The expansion in recent years of rural bank branches has brought financial services much closer to the rural population. Many village residents, however, still do not have easy access to such services. There appears to have been little experimentation in providing low cost services to villages in isolated areas. More analysis is needed to clarify why lenders haven't been more innovative, and the type of incentives, policies and assistance needed to encourage this development.

8. Farmers complain about collateral requirements for obtaining credit. The problem does not seem to be

significant for the overall sample because the average ratio of debt to value of land for the sample was only 3 percent. Considering only households with loans, it was 5 percent. However, it is a problem for the landless, for farmers with unclear land titles, and farmers with small amounts of land. Additional experiments are needed in ways to reduce collateral requirements for households for which this is a problem.

9. Government programs and policies during the past 6 years have resulted in a great expansion of agricultural credit. There are several reasons which suggest that credit is not a serious constraint for most households in the sample:

   a Less than half reported loans from formal sources.

   b. Levels of indebtness (D/A ratio) do not appear to be high.

   c. Informal sources of credit do not seem to be very important in aggregate terms.

   d. There does not appear to be a ready supply of unused, large lumpy investment alternatives available to accelerate agricultural growth. Pumps, tillers, sprayers and other machinery require the largest capital outlays and they seem to have spread rapidly, in areas where they are most profitable, with the existing credit system.

e. Reallocating household cash flows would appear to permit self-financing a considerable amount of investment.

f. High levels of loan default (such as occurred in the Philippines), which might prevent a borrower from obtaining new loans, don't seem to have occurred.

These points suggest that many farmers have unused borrowing capacity, and their most likely constraint is an adequate supply of good investment alternatives that will increase demand for credit.

10. Even though aggregate credit supply may be reasonably adequate, a number of changes in the delivery of financial services to villagers should be considered.

a. Additional efforts are needed to reduce loan collateral requirements, and substitute group lending, loan guarantees, etc. to reduce lender risk.

b. Debt repayment capacity should become the chief factor in allocation of credit. Current credit guidelines ignore the importance of cash receipts from nonfarm activities and off-farm work. Estimates of debt repayment capacity should be made based on total cash flow of the household rather than simply farm receipts.

c. Many rural lenders are not permitted to make loans for nonfarm enterprises even though they provide an important source of income in many villages. The heavy reliance on targeting of loans should be reduced because loan funds for targeted purposes can substitute for household savings in the finance of nontargeted purposes, and targeted funds frequently can be diverted to other uses. Moving away from targeting will reduce lender costs in policing loan use, and will reduce borrower costs by eliminating the need to hide the real use made of loan funds.

d. Additional experimentation and innovation is needed in making low cost financial services available in villages. Consideration should be given to the creation of provincial banks which may have more inclination to lend up-country than do Bangkok based banks.

e. Greater flexibility is needed in setting interest rates to reflect changes in inflation rates and to cover the risks and costs of making loans to different classes of borrowers.

f. Increased academic and in-service training will be needed for bank staff to meet the objectives of several of these recommendations. Public sector

subsidization and organization of this training could produce high social benefits.

g. The costs may always be prohibitive for banks to provide inexpensive, reliable financial services in rural villages because they must always follow complex rules and procedures designed to instill confidence in the country's currency and banking system. Experiments should be conducted in creating local savings and credit organizations (some variation of credit unions or savings and loan associations found in other countries) owned and managed by the users.

Sources of Farm Household Income and Income Distribution

1. Net household income was divided into the four categories of farm income, nonfarm income, wages, and other sources. These sources represented 35.5, 21.0, 28.5 and 15 percent, respectively, of total net household income. Thus only about one-third of total household income came from farming narrowly defined. The provincial averages for these data showed wide variation: Khon Kaen -- 47, 12, 24 and 19 percent; Roi Et -- 22, 28, 25, 25; Chiang Mai -- 19, 33, 35, 13; and Suphan Buri -- 71, -1, 22, 8.

These results suggest that previous estimates of household income may have underestimated income earned from sources other than farming. They also show that

households engage in a wide variety of economic activities.

2. Average household income varied widely among and within provinces. All sample villages in Suphan Buri had average income above the World Bank poverty line. One out of nine villages in Chiang Mai fell below the poverty line, along with four out of eight in Khon Kaen and two out of five in Roi Et.

   There was no particular pattern between source and level of income. Both the poorest and the richest villages in the sample received most of their income from nonfarm enterprises. Some of the villages which earned most of their income from farming were among the richest villages, while others were among the poorest.

   The source of primary income in a village depends on a complex set of factors including farm size, supply of irrigation water, location, access to markets, supplies of raw materials, and historical specialization in selected enterprises.

3. In all regions, there was a tendency for the amount of income received from all sources to rise as total household income rises. There was a tendency for the proportion of income received from farm enterprises to rise relative to other sources as total household income rises. Conversely, the proportion of income received from nonfarm enterprises, wages and other sources falls

as total household income rises. Wages and other income are the most important sources for the lowest income households.

4. Farm household income distribution was highly skewed. The 20 percent of the households that earned the highest incomes earned 50 percent or more of the total income earned by the sample. Conversely, the poorest 20 percent earned 5 percent of the total income or less. The Gini coefficient for the distribution of total household income was 0.44, which is fairly high by Asian standards.
5. The Gini coefficient of farm income alone was a very high level of 0.58, ranging from 0.53 in Suphan Buri to 0.66 in Chiang Mai. Adding nonfarm income to farm income improved the Gini coefficient in some regions and worsened it in others. The addition of wages and other income improved the distribution in all regions.

Employment, Underemployment and Unemployment on Farm-Households

1. The general conclusion which emerges from analysis of the employment data is that of a dynamic pattern of time allocation among enterprises during the year with high levels of labor force participation and a large number of hours worked throughout the year.
2. The farm-household labor force was defined to include all persons 7-65 years of age living in the household

regardless of age, health, family relationships or marital status. The labor force was subdivided into three categories: adult males and females (15-65 years), children (7-14), and persons over 65 years of age. Those aged 7-14 represented almost 24 percent of the household labor force, and those aged 61-65 represented another 2 percent.

3. The definition of economic activities for which hours of work were reported weekly was limited to major categories of work. Excluded were house work, child care, small enterprises like a few chickens or ducks, and general maintenance of buildings, fences and canals. This definition leads to an underestimation of total time spent on production activities and excludes household production which utilizes large amounts of time for women and children. A member of the household was considered to be employed if he/she reported at least one hour of work per week in the month. Thus, persons who worked very small amounts of time were defined as employed rather than unemployed.

4. During the survey year, the average monthly unemployment rate (persons working less than one hour per week during the month) was 6.9 percent for adult males and 9.2 percent for adult females. This rate included persons not working for any reason. An adjusted unemployment rate was estimated by eliminating all unemployed persons

who were sick, on holiday, going to school, etc. The average monthly adjusted unemployment rate has 3.8 percent for males and 6.3 percent for females.

The adjusted unemployment rate varied during the year with the seasonality of major crops. For men, the rate varied from 1.4 percent in July (peak plowing and planting month for rice) to 8.8 percent in February (dry season). For women, the lowest rate of 1.6 was in December (rice harvest) and the highest rate of 10 percent was in February. The monthly unemployment rates for men were normally lower than for women. The rates for both men and women were lowest in the North and Northeast provinces and highest in Suphan Buri.

5. The distribution of hours worked was analyzed by dividing adult males and females into three categories based on average number of hours worked per week during the month: 1-19 hours, 20-39 hours, and 40 hours and above. The average monthly employment rate (minimum of one hour of work per week per month) was high: 93 percent for adult males, 91 percent for adult females, 66 percent for children and 83 percent for old people.

The variation in hours worked per week followed seasonal patterns. The percentage of males reporting 40 or more hours of work per week ranged from a low of 28 percent in April to a high of 44 percent in July, November and December. The percentage reporting less

than 20 hours ranged from 11 percent in December to 20 percent in April. Seventeen percent of the females reported more than 40 hours of work in April and that percentage rose to 36 percent in December. Conversely, 14 percent reported less than 20 hours in March compared to 31 percent in October. For children, 58 percent reported at least one hour of work per week in June compared to 77 percent in December. For old persons, 76 percent worked at least one hour per week in June compared to a high of 91 percent in April.

6. The high proportion of adults reporting less than 20 hours of work could imply considerable underemployment. Caution must be used in making this interpretation. First, defining adults as persons aged 15-65 includes some who are too young and others too old to work year round. Second, adults between 20 and 60 years of age may choose to or may have to average out their work hours during the year. They may work over 40 hours per week during periods of peak farm work, then compensate by working less than 40 hours in other weeks. An analysis of average hours worked by a group of persons at one period time obscures this type of averaging process.

The analysis of possible underemployment was approached in a second way. An arbitrary standard of 40 hours per week for males, 30 hours for females and 20 hours for children and old people was utilized to obtain

hypothetical levels of full employment to compare with actual hours worked. Actual hours worked reached 85 percent of this standard for the year for the entire sample and exceeded 95 percent in July, August, November and December.

Allocation of Labor Among Economic Activities

1. Household family members allocate their work time among a variety of farm and nonfarm activities. About half of the total hours of work reported by the household labor force was allocated to farm work. The other half was allocated to off-farm work and to nonfarm enterprises. The proportion of total hours allocated to nonfarm and off-farm work was 38, 52, 73 and 24 percent, respectively, in Khon Kaen, Roi Et, Chiang Mai, and Suphan Buri provinces. For the entire sample, the proportion of time spent on farm work exceeded the time spent on other activities only during the four months of July, August, November, and December.
2. Adult males reported 1,650 to 1,800 hours of total work during the year in the North and Northeast, but only a little over 1,000 hours in Suphan Buri. Females reported 1,350 to 1,650 in the North and Northeast compared to 820 in Suphan Buri. Males reported more hours in off-farm work, while females reported more hours on nonfarm enterprises.

3. Most of the hours worked off-farm by both males and females were allocated to nonfarm enterprises. The exceptions were the months of June, July, and December because of the high labor demand in planting and harvesting periods. Off-farm work in nonfarm enterprises was still high in these months, however, so the primary adjustment was a reduction in hours spent on nonfarm enterprises in the household. Throughout the year, the total number of hours spent per month in off-farm work was less variable than the time spent on nonfarm enterprises.

4. The pattern of time allocation observed above has several possible explanations. First, off-farm enterprises frequently demand a fairly stable labor supply. Nonfarm enterprises in the household, however, are frequently more flexible in their labor demand. Therefore as farm labor demand changes during the year, the time spent in nonfarm enterprises can be adjusted more easily than time spent in off-farm work. Second, males have a comparative advantage in off-farm work because their wages are higher than those for females, so it is logical to find males working off-farm more than females. Furthermore, females tend to have the responsibility of caring for young children, garden plots, and minor enterprises such as pigs, chickens and ducks.

5. Children reported a low of 180 hours of work time per person per year in Suphan Buri and a high of 500 in Khon Kaen. Old persons reported a low of 200 hours per person in Chiang Mai compared to a high of 1,200 in Suphan Buri. Most of the work time of children was spent in farm and nonfarm enterprises, but little was spent in off-farm work. Old people spent much of their work time in nonfarm enterprises, sometimes even surpassing the time spent on farm work. The total number of hours worked per month and the hours devoted to farming by both children and old people was highest in the planting and harvesting periods.
6. The work time of a sample of Khon Kaen farm households was analyzed by farm size and source of water. The total number of hours worked by males tended to increase with farm size, while it decreased for females. The distribution of work time also changed. As farm size increased, adult males spent more hours on farm work, while the time spent on nonfarm work was roughly the same, but off-farm work sharply declined. For females, farm work was unchanged, nonfarm work declined, and off-farm work sharply declined.

Farm income, nonfarm income and total income went up as farm size increased but off-farm income declined. Households earned more than enough from the extra time spent on farming to compensate for the loss of income

which occurred when time was withdrawn from off-farm work.

There was little difference in the total number of hours worked by males, females, and children on irrigated versus rainfed farms. However, there was less month to month variation in hours worked on irrigated farms, and the pattern of distribution of work time among enterprises was different. Males, females and children spent more time on farm enterprises and less time on nonfarm enterprises on irrigated farms than on rainfed. This was due to more intensive cropping during the dry season on irrigated farms. Compared to rainfed farms, males on irrigated farms spent slightly less time on off-farm work, but females spent slightly more.

Farm income and total income were highest on irrigated farms. Even though rainfed households worked as many total hours, they were unable to increase their income enough from nonfarm enterprises and off-farm work to compensate for lower farm incomes.

7. Labor supply models were used to quantitatively test the factors affecting the time allocation of adult males and females. The analysis showed that households behave rationally with respect to time allocation. The models for off-farm labor supply showed that males and females devote more time to such activities when wages rise. Likewise, they spend less time off-farm when farm

earnings and farm size go up. Thus off-farm work and farm work compete for scarce labor. Also as workers get older and as they live farther from urban areas, they spend less time in off-farm work.

The time spent on nonfarm enterprises was harder to explain in the analysis. Higher earnings from these enterprises do not seem to be associated with more time spent on them. Farm earnings, however, were positively related to time spent working on these enterprises. The reason seems clear. When the household earns more farm income through increased farm size or irrigation, more time is spent on farm work and less off-farm. There is also proportionately more time available in periods of slack farm work which can be spent on nonfarm enterprises. Furthermore even in periods of peak farm labor demand, some time can be spent on nonfarm enterprises when farm work is interrupted due to bad weather or other reasons. Thus farm and nonfarm enterprises are much more complimentary than are farm and off-farm work.

Optimum Enterprise Combination and Allocation of Resources

1. Linear programming models were constructed for the typical farm-household in Khon Kaen and Chiang Mai to test for economic rationality and to predict the impact of simulated changes in resource prices and employment

opportunities. The general conclusion was that households allocate resources quite rationally, and there are relatively small gains to be made through resource reallocation among existing enterprises.

2. Average returns to labor followed a fairly consistent pattern. Farm enterprises tend to earn the highest returns, followed by off-farm work, then nonfarm enterprises. There is a range of labor earnings, however, so there are some farm enterprises that earn less than the average off-farm wage rate. Likewise, some nonfarm enterprises generate returns higher than some farm enterprises and off-farm work.
3. There is a fairly clear division of labor by age and sex for many of the tasks involved in many enterprises. Therefore, one type of labor may be underemployed because of a shortage of another type of labor. In some periods with peak farm labor demand, all household labor is fully employed in farm enterprises. In periods with less demand, labor is allocated to other enterprises.
4. Land is a constraint for small farms because the household utilizes all available land and allocates surplus family labor to nonfarm and off-farm activities. With additional land, more labor is allocated to farming and less to other activities.
5. The Chiang Mai analysis used B1.30 as the net return per hour to nonfarm enterprises. When the rate was

simulated at B2.75 per hour, competition between farm and nonfarm work occurred, especially in the dry season. The cropping index fell and the household spent more time on nonfarm enterprises.

The models of Khon Kaen rainfed and irrigated farms showed a response to wage rates. The base off-farm wage rate was set at B4.48 per hour for men and B3.75 per hour for women, then an increase of 30 percent was simulated. For rainfed farms, there was no effect on farm enterprises but households shifted out of nonfarm enterprises in order to work more off the farm. For irrigated farms, there was a small decline in farm work in the dry season, and an increase in off-farm work and some changes in nonfarm enterprises.

Another Khon Kaen model analyzed the important female enterprises of silkworm raising and silk weaving. The initial off-farm female wage rate was set at B2.75 per hour, then raised to over B3.00. The simulation resulted in a reduction of time spent on the silk enterprises so more time could be spent on off-farm work.

The implication of these analyses is that higher off-farm wage rates could have an impact on dry season farming and work on nonfarm enterprises. There is some level of off-farm wage rate that will tend to reduce the production of both farm and nonfarm products.

6. The Khon Kaen models were used to test the impact of eliminating off-farm work. This simulation caused little change in farm work, but a sharp increase in nonfarm enterprises. Net household income fell sharply, however, because the additional income earned from nonfarm enterprises could not fully compensate for the loss in off-farm income.

7. These modelling analyses confirmed that a delicate balance occurs in the use of resources, especially family labor, among farm, nonfarm and off-farm activities. Labor allocation patterns are complex as households respond to the labor demands of farm work, and to off-farm employment and wage opportunities. Labor use on nonfarm enterprises adjusts to the changes in demand for farm and off-farm work.

Undoutedly there are nonfarm enterprises that offer potential increases in returns to family labor. Eventually they could become competitive with both farm and off-farm work. But since the timing of work on nonfarm enterprises is frequently more flexible than for other types of work, farm and nonfarm enterprises will tend to be <u>complementary</u>, while farm enterprises and off-farm work will tend to be <u>competitive</u>.

OTHER PROJECT OUTPUTS

The research reported above was the main output of this project. However, as noted in appendix A, there were a number of other items listed in the scope of work for which there were additional accomplishments.

1. A workshop was held in Kathmandu, Nepal, April 7-11, 1980, to provide an opportunity for Asian scholars to exchange views on agricultural finance. The workshop was entitled "Small Farmers Development and Credit Policy" and copies of the Proceedings in which the papers are published are available from the Agricultural Development Bank (ADB) in Nepal. The ADB, the Ministry of Home Panchayat, and the Department of Agricultural Economics and Rural Sociology, OSU, co-sponsored this meeting. Over 60 persons attended, representing several Nepalese and foreign institutions. Richard Meyer helped organize the workshop, represented OSU at the meeting, and presented two papers.
2. In February, 1981, Richard Meyer spent a week working with USAID/Manila on financial issues related to a rainfed agriculture project being designed by that mission.
3. Throughout his stay in Bangkok, Richard Meyer consulted informally with USAID/Bangkok on a wide variety of issues being studied by the Mission.

4. Richard Meyer assisted with the M.S. thesis of Krishnan Hari Maharjan, a Nepalese student studying at Thammasat University. This thesis analyzed debt repayment problems in Nepal. The results were presented at the 1981 American Agricultural Economics Association meetings in a paper by Maharjan, Lookawenchit and Meyer entitled "Small Farmer Loan Repayment Performance in Nepal," The paper is now being reprinted by the Agricultural Development Council.
5. Tongroj Onchan and Richard Meyer presented papers in a workshop on agricultural finance held for the staff of the Bank for Agriculture and Agricultural Cooperatives in Bangkok.

APPENDIX A

SCOPE OF WORK AND SERVICES TO BE PROVIDED TO USAID/THAILAND FOR THE PROJECT ENTITLED RURAL OFF-FARM EMPLOYMENT PROJECT

A. Scope of Work and Services Provided

The Cooperator will provide one full time senior person in Thailand for a maximum of two years to provide overall direction to the data collection efforts needed to support the USAID Mission's "Rural Off-Farm Employment Project." Specific services are as follows:

1. He will assist Kasetsart University staff in designing and implementing field surveys relating to rural financial markets, farm household credit use and labor supply, and financial aspects of rural nonfarm enterprises.

2. He will provide advice to the researchers at Kasetsart University on methods of processing and analyzing the data generated in these areas, and will assist in analyzing results of field surveys and preparing final reports.

3. Where appropriate, he will help to identify U.S. and non-U.S. consultants to be funded by Ohio State University through existing cooperative agreement funds and/or other sources. These consultants will assist in rural household surveys and financial market studies.

4. In addition, he will provide advice to the Mission on ways of designing projects and policies that improve the performance of rural financial markets in servicing agricultural and nonfarm enterprises.

B. Personnel and Proposed Source of Payment

The cooperator agrees to provide the services of Dr. Richard L. Meyer to staff this agreement. His primary responsibility will be to work on the USAID/Thailand Rural Off-Farm Employment Project for a maximum of a maximum of a two-year period. In addition, he will serve as in-country representative (with the expected title of Chief of Party) for the AID/OSU Cooperative Agreement AID/ta-CA-1. In this latter capacity, he will assist with all research and technical assistance activities contucted in Thailand under the Agreement. Furthermore, in consultation with the AID Office of Rural Development and Development Administration, he will participate in other Agreement activities such as, but not limited to, the following:

1. Participate in workshops, conferences, and meetings conducted under the agreement in Asia and elsewhere;

2. Distribute books, publications, references and other information as part of the research and technical assistance network on rural financial markets;

3. Identify and assist in the programming of LDC students for graduate study of rural financial markets in the U.S.; and

4. Participate in evaluations of the activities conducted under the agreement.

5. Prepare and submit a final report which summarizes all activities in connection with the project. Such report shall be submitted in duplicate to the AID Project Office designated herein within 30 days of completion of Project activities. One (1) copy shall be submitted to the Agreement Office whose name appears on the Cover Page of this agreement.

APPENDIX B

LIST OF PUBLICATIONS
RURAL OFF-FARM EMPLOYMENT ASSESSMENT PROJECT
CENTER FOR APPLIED ECONOMICS RESEARCH

RESEARCH PAPERS

No. 1 Tongroj Onchan, Pradit Charsombut, Richard L. Meyer and Donald C. Mead, "Description of the Rural Off-Farm Employment Assessment Project in Thailand," October 1979.

No. 2 Donald C. Mead and Pradit Charsombut, "Rural Off-Farm Employment in Thailand: Phase I Survey Results," June 1980.

No. 3 Donald C. Mead and Richard L. Meyer, "Rural Off-Farm Employment Surveys: Approaches and Methodology," May 1981.

No. 4 Tongroj Onchan and Yongyuth Chalamwong, "Rural Off-Farm Employment and Income of Rural Households in Thailand: Some Research Findings," October 1981.

No. 5 Donald C. Mead, "Subcontracting in Rural Areas of Thailand," November, 1981.

No. 6 Merle Menegay and Nittaya Wongtada, "The Fruit and Vegetable Processors of Northern Thailand--Focus on Traditional Pickling & Preserving Firms," January 1982.

No. 7 Somsak Priebprom, The Role of Farm, Nonfarm Enterprises and Off-Farm Work in Household Employment and Income Generation on Irrigated and Rainfed Farms, Khon Kaen, Thailand," July 1982.

No. 8 Somsak Priebprom and Warren H. Vincent, "Combining Farm and Nonfarm Labor Employment Opportunities for Improving Income and Employment on Rainfed Farms, Khon Kaen, Thailand," August 1982.

No. 9 Saroj Aungsumalin, "The Generalized Linear Programming Model to Estimate Seasonal Credit Needs of Nonfarm Firms," August 1982.

No. 10 Saroj Aungsumalin and Warren H. Vincent, "Seasonal Credit Needs of Cement Product Firms in Rural Thailand," August 1982.

No. 11 Yongyuth Chalamwong, "Development of Cottage Industries, Female Labor Force Participation, and Human Fertility in Rural Thailand," August 1982 (in Thai).

No. 12 Sungvean Chanthongkaew, "Hand Tools Industry in Roi Et and Chiang Mai," August 1982.

RESEARCH PAPERS (cont'd)

No. 13 Wachira Wichaiwatana, "Factors Affecting the Supply of Labor for Off-Farm Work in Rural Thailand," August 1982 (in Thai).

No. 14 Yongyuth Chalamwong and Richard L. Meyer, "Farm Household Income Levels, Sources and Patterns in Selected Thai Villages," August 1982.

No. 15 Thanwa Jitsanguan, "Effect of Off-Farm Employment on the Structure and the Distribution of Income," August 1982.

No. 16 Yongyuth Chalamwong, "Rural Household Labor Supply for Off-Farm Work in Thailand," August 1982.

WORKING PAPERS

No. 1 Merle Menegay and Vinich Veerayangkul, "Kenaf Processing in Northeastern Thailand," August 1980.

No. 2 Tongroj Onchan, "The Textile Products Industry in Rural Thailand," August, 1980.

No. 3 Pradit Charsombut, "The Silk Weaving Industry in Northeastern Thailand," August 1980.

No. 4 Pradit Charsombut, "Mat Making and Fish Net Making in Northeastern Thailand," September 1980.

No. 5 Merle Menegay and Vinich Veerayangkul, "Agricultural Hand Tool, Animal Implement, and Machinery Manufacturers in Towns Within Chiang Mai, Khon Kaen and Suphanburi Provinces," September 1980.

No. 6 Saroj Aungsumalin, "The Brick Industry in Chiang Mai: A Preliminary Survey," September 1980.

No. 7 Somsak Priebprom, Rapeepun Jaisaard and Richard L. Meyer, "Farm Household Modeling: Objectives and Methodology," November 1980.

No. 8 Merle Menegay, Suwapote Lekawathana and Vinich Veerayangkul, "The Fruit and Vegetable Processing Industry in Selected Areas of Chiang Mai, Khon Kaen and Roi Et Provinces," November 1980.

No. 9 Richard L. Meyer, "Formal Credit Supplies for Rural Enterprises," November 1980.

No. 10 Donald C. Mead and Vinai Artkongharn, "Profitability and Efficiency: Some Preliminary Survey Results," November 1980.

No. 11 Jeerakiat Apibunyopas, "An Economic Analysis of Employment in Kenaf, Cassava and Sugarcane Production and Processing in Northeast Thailand," November 1980.

No. 12 Yongyuth Chalamwong and Richard L. Meyer, "Wealth and Credit: A Descriptive Analysis of Farm Household Balance Sheets," November 1980.

No. 13 Saroj Aungsumalin, "Financial and Economic Analysis of Selected Small-scale Industries," November 1980.

No. 14 Rapeepun Jaisaard and Saran Arayarangsarid, "Preliminary Results of Farm and Household Modeling in Chiang Mai," December 1980.

No. 15 Somsak Priebprom, "Preliminary Results of a Rainfed Agriculture Model in Khon Kaen Province," November 1980.

No. 16 Tongroj Onchan, "The Ready-Made Garment Industry in Rural Thailand: An Overview," November 1980.

No. 17 Orasa Kiatying-Ungsulee and Richard L. Meyer, "Distribution of Farm and Nonfarm Enterprises in Farm Households," November 1980.

WORKING PAPERS (cont'd)

No. 18 Preeyanuch Apibunyopas, "Entrepreneurship: Survey Results," November 1980.

No. 19 Vinich Veerayangkul and Merle Menegay, "The Kuaytiaw Processing Industries in Selected Areas of Chiang Mai, Khon Kaen and Roi Et Province," November 1980.

No. 20 Vinich Veerayangkul and Merle Menegay, "The Soybean Curd Processing Industry in Selected Areas of Chiang Mai, Khon Kaen, and Roi Et Provinces," November 1980.

No. 21 Saroj Aungsumalin, "A Study of the Cement Products Industry in Three Provinces of Thailand: A Preliminary Report," November 1980.

No. 22 Yongyuth Chalamwong, "Economic Analysis of Labor Supply of Farm Families to Nonfarm Enterprises: A Preliminary View," November 1980.

No. 23 James Boomgard and Merle Menegay, "A Market Systems Approach to Research of Small-Scale Industries," November, 1980.

No. 24 James Boomgard, "A Preliminary Assessment of the Furniture Subsector in Three Provinces of Thailand," November 1980.

No. 25 Somchai Thepthana, "The Brick Industry in Selected Provinces: A Preliminary Report," November 1980.

No. 26 Sumala Sirichoti and Richard L. Meyer, "Employment Patterns and Potential in Farm Households," November 1980.

No. 27 Amnaj Thiravanich, "Preliminary Results: Farm Household Model in Roi Et Province," November 1980.

No. 28 Pradit Charsombut, "Silk Weaving Industry: Preliminary Results," November 1980.

No. 29 Jacques Amyot, "Small Industrial Enterprise Supportive Institutions: A Preliminary Assessment," January 1981.

No. 30 Jacques Amyot, "Northern Region Industrial Support Institute: Evaluation and Planning Perspectives," April 1981.

No. 31 Narongchai Akrasanee, "Government Policies, Rural Industrialization and Employment," June 1981.

No. 32 Saroj Aungsumalin, "Cement Products Industry in Rural Thailand," January 1982.

No. 33 Yupandee Siriwan, "Cash Flow Analysis of Farm Households in Chiang Mai," June 1982.

No. 34 James Boomgard, "The Woodcarving Industry in Northern Thailand: Summary of Research Findings," September 1981.

CONFERENCE PAPERS

No. 1 Yongyuth Chalamwong and Tongroj Onchan, "Land Characteristics and Tenure Arrangement in Selected Rural Areas in Thailand," April 1981.

No. 2 Tongroj Onchan, "Lender Behavior in Financing Rural Nonfarm Enterprises," June 1981.

No. 3 Donald C. Mead, "Subcontracting in Rural Areas of Thailand," June 1981.

No. 4 Yongyuth Chalamwong, "A Descriptive Analysis of Wealth, Income and Credit in Rural Thailand," June 1981.

No. 5 James Boomgard, "Marketing of Rurally-Produced Nonagricultural Products: A Report on Village Visits," June 1981.

No. 6 Vinai Artkongharn, "Profitability and Efficiency," June 1981.

No. 7 Tongroj Onchan, "The Ready-Made Garment Industry in Rural Thailand: A Research Report," June 1981.

No. 8 Preeyanuch Apibunyopas, "Entrepreneurship and the Performance of Nonfarm Firms," June 1981.

No. 9 Adelaida P. Alicbusan and Yupadee Siriwan, "A Cash Flow Analysis of Farm Households in North and Northeast Thailand," June 1981.

No. 10 Saroj Aungsumalin, "Financial Structure and Perception Toward Constraints," June 1981.

No. 11 Somsak Priebprom, "An Economic Analysis of Irrigated Farm Household Model in Khon Kaen Province," June 1981.

No. 12 Jeerakiat Apibunyopas, "An Economic Analysis of Employment in Kenaf, Cassava and Sugarcane Production and Processing in Northeast Thailand," June 1981.

No. 13 Donald C. Mead, "Village Headman Questionnaire: Survey Results," June 1981.

No. 14 James Boomgard, "An Assessment of Changwat Level Furniture Production in Three Provinces of Thailand," June 1981.

No. 15 Merle Menegay, "A Marketing Perspective for Village Farm Products: A Basis for Discussion," June 1981.

No. 16 Orasa Kiatying-Ungsulee, "Distribution of Farm and Nonfarm Enterprises in Farm Households," June 1981.

No. 17 Pradit Charsombut, "The Silk Industry in Thailand," June 1981.

No. 18 Yongyuth Chalamwong, "An Analysis of Household Labor Supply for Off-Farm Enterprises," June 1981.

CONFERENCE PAPERS (cont'd)

No. 19 Sompong Orapin, "A Descriptive Analysis of the Cotton Weaving Industry in Rural Areas in Thailand," June 1981.

No. 20 Wilailuck Thaiutsa, "A Case Study on the Bamboo Products Industry in Khon Kaen, Roi Et and Chiang Mai Provinces," June 1981.

No. 21 Maythakul Kiatkrajai and Doosanee Songmuang, "Village Industry Studies, Pottery Products Industry," June 1981.

No. 22 Sumala Sirichoti, "Employment and Underemployment," June 1981.

No. 23 Pichit Thani and Jamaree Pitackwong, "Informal Credit for Farm Households in Chiang Mai," June 1981.

No. 24 Sungvean Chanthongkaew, "Hand Tools Industry in Roi Et and Chiang Mai," June 1981.

No. 25 Nongluk Suphanchaimat, "Rainfed Farm Household Modeling in Khon Kaen," June 1981.

No. 26 Rapeepun Jaisaard, "Results of Farm Household Modeling in Chiang Mai," June 1981.

No. 27 Somchai Thepthana, "Farm Size and Productivity: A Case Study of the Brick Industry in Thailand," June 1981.

No. 28 Rangsit Poosiripinyo and Pradit Charsombut, "Mat Production in the Northeast," June 1981.

No. 29 Vinich Veerayangkul and Merle Menegay, "The Soybean Curd Processing Industry in Selected Areas of Chiang Mai, Khon Kaen and Roi Et Provinces," June 1981.

No. 30 Vinich Veerayangkul, "Kuay Tiaw Industry," June 1981.

No. 31 Amnaj Thiravanich, "Summary of a Study on a Farm Household Model in Roi Et Province," June 1981.

No. 32 Jacques Amyot, "Institutional Support of Small Industrial Enterprise Development in Thailand," June 1981.

No. 33 Merle Menegay and Nittaya Wongtada, "The Fruit and Vegetable Processors of Northern Thailand: Focus on Traditional Pickling and Processing Firms," June 1981.

No. 34 Plaeuk Sangsingkeo, "The Wood Carving Service Cooperative: A Case Study." (Not available).

No. 35 James Boomgard and Merle Menegay, "Marketing Patterns for Manufacturing Firms in Rural Towns: Survey Results," January 1981.

PAPERS PRESENTED AT THE FINAL PATTAYA CONFERENCE THAILAND, SEPTEMBER 18-19, 1982

No. 1 The Importance, Concepts and Contents of the Rural Poverty Development Program (in Thai).

No. 2 Problems of Promotion and Development of Rural Small-Scale Industry (in Thai).

No. 3 Onchan, Tongroj, "Some Relevant Ideas and Recommendations Related to the Strategy in Development of the Rural Thai Economy" (in Thai).

No. 4 Priebprom, Somsak, "Income and Employment in Rural Areas" (in Thai).

No. 5 Priebprom, Somsak, "The Potential of Improving Income of the Rural Households in Thailand" (in Thai).

No. 6 Chalamwong, Y. and R. L. Meyer, "A Review of Econometric Studies of the Supply of Rural Household Labor to Off-Farm Work and Nonfarm Activities in Thailand" (in English).

No. 7 Siriwan, Yupadee, "Cash Flow Analysis of Farm Households in Chiang Mai and Khon Kaen Provinces," (in Thai).

No. 8 Wichaiwatana, Wachira, "Off-Farm Employment and Rural Development in Thailand" (in Thai).

No. 9 Mead, Donald C., "Patterns of Rural Industrial Growth: Some Generalizations from Thailand" (in English).

No. 10 Charsombut, Pradit, "Rural Small-Scale Industries: Structural Characteristics, Problems, and Development Potential" (in Thai).

No. 11 Aungsumalin, Saroj, "Financial Structure and Demand for Credit of the Rural Small-Scale Industries" (in Thai).

No. 12 Onchan, Tongroj, "Problems Related to Financial Sources and Credit of Rural Small-Scale Industries" (in Thai).

No. 13 Veerayankul, V., "Management Problems in Rural Small-Scale Industries" (in Thai).

No. 14 Babb, E. M. and P. Apibunyopas, "An Analysis of Factors Affecting the Performance of Small Rural Nonfarm Firms in Thailand" (in English).

No. 15 Apibunyopas, J., T. G. Baker and E. W. Kehrberg, "The Impact of Producing Pulp from Kenaf on Employment and Income in Northeast Thailand" (in English).

No. 16 Artkongharn, Vinai, "Efficiency and Profitability of Selected Small-Scale Rural Industries" (in Thai).

No. 17 Meyer, R. L., "A Summary of Key Findings of the Farm Household Analysis" (in English).

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No. 3 Aungsumalin, Saroj, "The Use and Productivity of Short Term Credit in Small-Scale Cement Products and Ready-Made Garment Firms in Thailand," Unpublished Ph.D. Dissertation, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1982.

No. 4 Banno, Yasuo, "Farm Household Labor Supply in Non and Off-Farm Work in Rural Thailand," Unpublished M. S. Thesis, Faculty of Economics, Thammasat University, Bangkok, Thailand, 1982.

No. 5 Boomgard, James J., "The Economics of Small-Scale Furniture Production and Distribution in Thailand," Unpublished Ph. D. Dissertation, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1983.

No. 6 Chalamwong, Yongyuth, Richard L. Meyer and Leroy J. Hushak, "Allocative Efficiency of Part-Time and Full-Time Farms: The Case of Thailand," Economics and Sociology Occasional Paper No. 979, The Ohio State University, Columbus, Ohio, February 1983.

No. 7 Mead, Donald C., "Subcontracting in Rural Areas of Thailand," Working Paper No. 4, Michigan State University International Development Papers, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1982.

No. 8 Meyer, Richard L. and Adelaida P. Alicbusan, "Farm Household Heterogeneity and Rural Financial Markets: The Case of Thailand," Economics and Sociology Occasional Paper No. 938, The Ohio State University, Columbus, Ohio, August 1982.

No. 9 Meyer, Richard L., Chester B. Baker and Tongroj Onchan, "Agricultural Credit in Thailand," Research Report No. 6, Center for Applied Economics Research, Kasetsart University, Bangkok, Thailand, May 1979.

No. 10 Onchan, Tongroj, Pradit Charsombut and Yongyuth Chalamwong, "Rural Development Policy of Thailand: Relationship Between Farm and Nonfarm Enterprises," Report of the Rural Off-Farm Employment Assessment Project, Center for Applied Economics Research, Kasetsart University, Bangkok, Thailand, January 1982 (in Thai with an English abstract).

No. 11 Priebprom, Somsak, "Employment and Income from Farming, Nonfarm Enterprises and Off-Farm Work on Irrigated and Rainfed Farms, Khon Kaen, Thailand," Unpublished Ph.D. Dissertation, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1982.