

## ANNEX C

### PUBLICATIONS OF ROFEAP PROJECT

Annex C lists out the publications of Rural Off-Farm Employment Assessment Project which have been prepared by the Center of Applied Economics Research. These publications include research papers, conference papers, working papers and monograph. In addition, synopsis is provided for every research paper and for selected conference and working papers which deal with the subjects not covered in the research papers.

#### 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.

The objective of the Project is to provide data and analysis needed to identify and develop appropriate projects and policies to assist in the expansion of non-farm employment and income opportunities in the rural areas and market town in Thailand. The Project is planned to cover three major components: rural non-farm enterprises, farm level surveys and rural financial markets. Each is discussed with some of the issues to be studied and general research methodology. The Project is going to conduct survey on firms and households located in selected provinces in the north, the Northeast and the Central areas. Besides the studies, the Project will include also a technical assistance component, a series of conferences and workshops, and development of future project.

Secondly, the paper outlines the project implementation, involving implementing agencies and implementation schedule of the Project.

Lastly, the paper presents details on evaluations of the Project which will assess the progress of the studies and analyses being conducted.

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

This paper provides information needed for the Phase II survey of the Project. Regarding information on the villages the paper gives the framework for selection of both villages and individual households for more detailed and comprehensive Phase II surveys. For information on towns, the paper provides a detailed list of all firms in each town covered, as well as information about the characteristics of each firm.

In addition the paper covers important information concerning pattern of agricultural activities in the areas studies and the types of non-agricultural pursuits in which village and rural town households are engaged.

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

This paper describes the methodology employed in the Project for village and town surveys. The village survey is on selected households representing various combinations of farm and non-farm activities, and on detailed information concerning pattern of production, resource use and finance. The town survey is a monthly survey on selected firms to collect information concerning employment, production and sales. The monthly information is supplemented by additional five surveys to capture more detailed information about particular aspects of the firms entrepreneurship, marketing, production costs, labor force and finance. Both village and town surveys are administered over a period of one year.

The problems on village survey are concerned with the field supervision of enumerators, to ensure a consistently high quality of data and the processing of this vast amount of data. The problem on town surveys is the increasing reluctance on the part of the respondents to accept the intrusion by enumerators on their time and their privacy and costly procedures for channeling all informations from the town surveys.

The surveys of village and town provide information needed to identify and develop appropriate policies and programs for the rural and non-farm sectors.

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

This paper provides information on poverty and income distribution of the Thai farmers in the rural areas. The paper describes that their incomes tend to increase overtime at a very low rate and their income distribution is very unequal. The low income farmers are usually those who own small-size farms, who are tenants and who are rice or upland crop farmers in the rainfed area.

The paper finds that a considerable portion of family income is from non-farm employment. In some areas, it accounts for over 50 percent of the total family income. It is also interesting to note that non-farm income constitutes a greater proportion of the total income of small farmers. It is also found that non-farm income helps stabilize family income over the 12-month period. Besides, non-farm income tends to equalize the distribution of income among farmers.

The paper argues that government policies and programs designed and implemented to solve income problem of the rural people have not been of much success. New concepts and new strategies of government policies have to be set up with programs especially designed for the target groups. The target groups have to be systematically identified and efforts must be seriously made to better understand their conditions and problems. Moreover, the policies should be designed to have an effect on both demand and supply of the rural non-farm employment.

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

This paper provides a brief discussion of how subcontracting arrangement operates and a survey data on people engaged in subcontracting work in the production of ready-made garments, silk, wood carving, fish nets and knitting. The people are engaged in a variety of activities and spend substantial amount of time in agriculture during the period of planting and harvesting. But seasonal variation in agricultural works does not affect wage rates of subcontract workers, which are reported to be very low.

Advantages of subcontracting work are flexibility working time, provision of technical, marketing and financial assistance by parent firms, and reduction in social and economic costs of urbanization, some disadvantages identified are lack of suitable rules and regulations, and risks of exploitation.

To promote the subcontracting system the paper suggests that promotion programs based on government sector or a private organization with one or two effective promoters for each program are needed. Moreover, taxation and regulation which are appropriate for the subcontracting system should be introduced.

No. 6 Merle Menegay and Nittaya Wongtada, "The Fruit and Vegetable Processors of Northern Thailand-Focus on Traditional Pickling and Preserving Firms", June, 1981.

This paper is an analysis on the longitudinal survey from a sample of pickling firms in Chiang Mai. The industry is reported to be very seasonal both in sales of the product and purchases of raw materials. The timing of seasonality of the sales and purchases caused considerable cash flow problems for certain types of processors. Moreover, the monthly variation in supply of raw materials results in a very dynamic change in price, which is the most frequently mentioned problem. Another problem related to raw materials is the high rate of spoilage after having been in storage for a certain period of time. Other than high prices and quality problems for raw materials, working capital is of major concern especially for those firms which have money tied up in large inventories of final product and in account receivable from the retailers they supplied.

The technology used in the pickling process is relatively simple which extends back for several generations and requires no machinery except water pump. Laborers work in the industry are mostly family members with few hired workers, permanent or temporary of non-skilled labor or at best semi-skilled labor. The major functions undertaken by family members include marketing, management of the production process, basic record keeping and participation in the production and packaging processes while works that can not be handled by them are done by hire labours. The payment for the hire labor is on a daily wage basis. The paper argues that the payment should be on a unit daily basis to improve labor productivity and to lessen absenteeism.

The paper also points out several issues on the industry i.e. comparative labor productivity per man day in Bangkok and Chiang Mai, barriers to entry, profitability and product flexibility.

The policy and program actions which may be helpful to the industry include: to identify the types and amount of new preserved fruit and vegetable products preferred by the Thai consumer, to resolve various technical problems encountered by the industry; to specify government regulation regarding health standards, to provide informations on close substitute use of chemical ingredient, to indicate on opportunity for expansion in related industry and to initiate changes or to improve the management of these types of small firms.

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

This paper provides more detail on non-farm and off-farm activities and their relationship to farm activities in both rainfed and irrigated areas in Khon Kaen province. It describes also the role of non-farm enterprises and off-farm work on rural household employment and income.

The paper reveals that non-farm enterprise as well as off-farm employment are a part of farm household's way of life along with farming even in the areas of more intensive farming systems. Non-farm enterprises i.e. sericulture, silk weaving, sticky rice container making, mat making, cotton weaving and basket making and off-farm employment generate a significant amount of income and employment. The degree of income and employment provided by non-farm and off-farm employment however varies according to farm size and type of activities engaged in rainfed or irrigated area. Moreover, the paper reports that the roles of men, women and children are different among the types of

enterprise and among activities performed within enterprise and also by the farming situation (i.e., rainfed or irrigated).

The implication of the paper for the rainfed area is to promote both non-farm and off-farm works in the rural areas and for irrigated area is to promote higher crop intensification to increase income and employment.

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

This paper develops a poly-period linear programming model for a rainfed farm household in Khon Kaen. The model is used to analyze the effect of non-farm household enterprises and off-farm employment on household income, and on the use of labor and other resources. In addition a simulation exercise is carried out based on certain sets of assumptions.

The programming solutions demonstrate that giving loans to rainfed farmer is not very risky since they will still be able to obtain enough family net income for saving at the production level as much as a 20 per cent below the average normal crop yield of rice. In order for the rainfed farm households to attain maximum annual family income, the paper suggests that the households should combine activities on farm, non-farm and off-farm employment. Female households, should work off-farm on a part time basis if employment opportunities exist and skill workers should perform silk weaving activities while the unskilled ones should be engaged in mat making activities. Other suggestions of the paper are that the rainfed farmers should produce glutinous rice only for family consumption and non-glutinous rice for commercial sales; the large farm households should hire in many hours of both male and female labor especially during the peak periods of rice production; and the households should engage in two additional production periods for sericulture.

The paper also suggests areas for further research including: identifying additional potential crops for rainfed farms in the rainy seasons and new product development in the area; providing more information on the economics of individual non-farm enterprises regarding technology and marketing and developing further on the research methodology.

No. 9 Saroj Aungsumalin, "The Generalized Linear Programming Model to estimate Seasonal Credit Needs of Non-Farm Firm", August, 1982.

This paper develops and presents a generalized linear programming model to analyze seasonal credit needs. The description of the model starts with the assumptions which provide the general setting of the markets and the behaviour of the firm, the objective function the activities and the constraints. The objective function of the firm is assumed to maximize return to fixed assets, family labor, and equity capital subject to the following constraints: inventory, demand, credit sales, machinery, cash needed to hire skill labor, unskill labor, to pay for overhead cost, to pay for taxes, to pay for dividends interest payment and principal repayment of outstanding long-term debt, savings, borrowing, initial cash on hand and cash balance. The activities are divided into four groups, i.e., production, selling, labor hiring and financial activities. The mathematical model is then presented followed by the LP tableau.

From the model the following variables are determined: (1) production flow by product and by period; (2) accumulation and liquidation of inventory of product by product and by period; (3) amount sold in cash and on credit by product and by period; (4) the use of machinery by product and by period; (5) the use of labor and labor cost of skill and unskill labor by period; (6) tax, dividends, overhead cost, interest payment and interest income by period; (7) borrowing, repayment, and out-

standing by source and by period; (8) savings deposit, withdrawal, and balance by period; and (9) net return to fixed assets, family labor, and equity capital.

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

The paper presents an attempt to model the cash flow situation of cement product firms, and to relate this to short-term credit demand. It recommends that lending and establishment of ceilings should be based on the proforma cash flow of the firm, the income statement, and the balance sheet. This subject is also treated extensively in a dissertation written by Saroj Aungsumalin: "The Use and Productivity of Short-term Credit in Small Scale Cement and Ready-Made Garment Firms in Thailand", Michigan State University, 1982.

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

The paper examines the impact on human fertility of the development of cottage industries through female labor force participation in the rural areas. The framework used includes consideration of the interrelationship of female labor force participation with human fertility.

To-examine the simple relationships between female labor force participation in cottage industries and fertility, the simple cross-tabulation is used. It is found that women who work solely in agriculture have the highest fertility rates among those who work in small cottages industries and those who work for wages. Regarding the relationship between land and fertility, land ownership status is shown to have clearly positive association with fertility; land quality shows no consistent pattern of association with fertility and land size shows unclear relationship with fertility. The relationship between income and fertility also shows no consistent pattern.

Simultaneous linear equation models are used to examine: a) the importance of sources of labor force participation by non-farm activities and fertility; b) the importance of female labor force participation in wage labor and fertility; c) the importance of the development in cottage industries which influences allocation of time of female participation in such activities and fertility; and d) the total hours worked in all activities and fertility. The results of all those models indicate the importance of the effect of women's labor force participation, especially in small cottage industries upon fertility.

The results are expected to be helpful in policy and program on population. In order to reduce fertility, the government should consider actions which have effect upon income of the family, female labor force participation, an increase in land size, and land improvement.

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

Relatively low returns to labor in some areas are a function of the availability of steel and charcoal, and technologies in current use. Efforts to improve output and income will require introduction of better equipment and machinery, removal of input constraints, and provision of credit to finance the shift in technology.

No. 13 Vachira Vichaiwattana, "Factors Affecting the Supply for Off-Farm Work in Rural Thailand", August, 1982.

This paper examines factors affecting the supply for off-farm work in rural areas. Regression models are used to determine the effects of various factors. The results of the models show that signi-

ficant variables which explain off-farm work of male and female are off-farm wage rate, farm and non-farm earnings, number of adults, and number of dependents aged 0-5 years.

The policy implication of this paper is that the government should promote off-farm activities in the rural areas by developing rural public work programs which will induce more off-farm work, improve off-farm labor productivity by means of increasing skill for labor, and encourage rural cottage industries. However, at the same time the government should not neglect to promote and develop farm works in the rural area by improving farm productivity.

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

This paper is an analysis on income situation of villages and households sampled in the Project. The sample consisted of 424 farm households from the four provinces of Chiang Mai, Khon Kaen, Roi Et and Suphan Buri. The survey data obtained from this sample covered the period starting March 1980 and ending February 1981.

The paper firstly presents the household income data on regional averages and a comparison of this regional income made with the estimation of the World Bank. The income estimates of the paper show that the highest average incomes are found in the Central region, which has the most favourable farm production conditions, and the lowest incomes are found in the Northeast with poorest production possibilities. However, the income estimates reported in the paper are higher than the estimates of the World Bank, which is perhaps due in part to sampling differences, and farm household income growth rates that were higher than the inflator used with the Bank data.

The paper secondly presents average village incomes which are also compared with the poverty line calculations of the World Bank. Selected characteristics of villages above and below the poverty line are also presented with special emphasis on the sources of income. An effort is made to detect patterns in sources of village income as a possible explanation for the levels of income observed. However, the paper finds that Thai villages are extremely complex and heterogenous with respect to the levels, source and patterns of income received by farm households. Considering the total net household income reported in all villages, about 35 percent came from farm activities, 21 percent from non-farm activities, 28 percent from wages and 15 percent from others sources.

The paper thirdly examines the variability of income over time. It explains that the wide variety in income received during the year arises from the heterogeneity in income sources.

Due to the heterogeneity in income levels, sources and patterns, the policy implication suggested by this paper is that there should be a comprehensive set instead of a single easy way to improve the income and welfare of rural Thai households, the details of which are dealt with in other papers.

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

This paper discusses in detail the effect of off-farm employment on the income structure and distribution in the four provinces namely Khon Kaen, Roi Et, Chiang Mai and Suphan Buri.

The paper points out from data of the four sampled provinces that other than farm income, off-farm and non-farm income contribute a considerable portion of income. These two sources of income serve to stabilize current income of farmers when the expected farm income is lacking.

Regarding the distribution of income, the paper indicates changes in income distribution among various income classes when farm, non-farm and off-farm incomes are taken cumulatively into consideration. The changes result in an improved situation for farmers in every province especially the low income farmer groups.

The paper also measures the change of income and of farm household distributions by using the Gini Coefficient technique. The result shows that when non-farm and off-farm incomes are taken into account with total income, the average Gini Coefficient is gradually decreasing. This implies that the off-farm employment helps to diminish the extent of income inequality.

The factors influencing income of farm household resulting in the difference of income distribution are also identified. The important factors considered in the paper are total man-days, current value of fixed capital, age and education of household head, number of household member, credit for production, expenditure on fertilizer and insecticide and the status of land ownership or land tenant. The multiple regression analysis is applied with these factors incorporated in the model. Results of multiple regression show that education of household head, number of household member, value of fixed capital and farm size are significant for some provinces only while man-days and credit are significant for every area. The rest of the factors are relatively non-significant in every area. The regression results are then used as a guideline in recommending policies which will help to create and develop the off-farm and non-farm activities.

The paper recommends to: promote labor intensive; low capital investment; and operation which using simple or intermediate level of flexible technology. The formulation of policy should concentrate on the off-farm activities that possibly take place after the crop season and such activities should be made short enough to allow farmers to sell their products for current expenses. Moreover, special credit programs as well as training courses should be set up to encourage the household industries and marketing information on products should also be provided to the farmers.

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

This paper investigates factors affecting the farmer's decision to work in the off-farm labor market. Regression models are used to determine the effects of various factors on off-farm labor supply. These factors are own off-farm wage rates for both male and female, farm earnings, non-farm earnings, farm characteristics (farm size, modern farm tools and equipment and the multiple cropping index) and the household environment (number of adults, education and number of dependents aged 7-11 years old). Many functional forms are tried and a logarithmic functional form gives better estimates and a better goodness of fit. The results of the stepwise regression models representing farm operators (males) in the family show that own off-farm wage rate, spouse's off-farm wage rate, unearned income and multiple cropping index have positive sign while farm and non-farm earnings, farm size and asset have negative sign. The magnitude of the elasticities of these variables are 0.47, 0.14, 0.24, 0.16, 0.14, 0.14, 0.28 and 0.09 respectively. The results of another stepwise regression models representing the operator's spouse (females) indicates that the statistically significant variables are own off-farm wage rate (+0.57), farm earnings (-0.18), unearned income (+0.15), farm size (-0.25), multiple cropping index (+0.08), number of adults (+0.36), education (-0.51), and number of dependents aged 7-11 years (-0.61). In general, the results show that the set of explanatory variables support the hypotheses in explaining the variation in operator's off-farm labor supply.

No. 17 Richard L. Meyer and Adelaida P. Alicibusan, "Farm Household Heterogeneity and Financial Needs", August, 1982.

The paper describes the heterogeneity of financial needs of farm households in low income countries, and its implications for rural financial intermediation. The heterogeneity of the farm house-

holds for financial needs exists because of differences in enterprise combination, production and marketing techniques, family lifecycle, investment opportunities, management efficiency, consumption preferences and a variety of other factors. Cash flow of the Thai farm households are analyzed from weekly data collection to illustrate the heterogeneity that exists among farm households. The studies of other countries on cash flow namely the Philippines and Nigeria are also presented to show that the heterogeneity of farm households regarding their financial needs are similar.

In order to serve the needs and interests of farm households which are complex, the paper suggests the policy makers to design flexible, multiple-purpose financial intermediaries. These institutions should be one-step centers in offering both borrowing and savings services; available of loans on production, consumption, investment and non-farm activities; and flexible on borrowing and repayment times, loan procedures and interest on loans and savings deposits. Moreover, the paper suggests the government to develop a well designed savings strategy for the rural area.

No. 18 Vinai Artkongharn, "Profitability and Efficiency", January, 1983.

This paper estimates the rate of return per hour of labor for each major product output of each type of firm, profitability, returns to capital, and capital-labor ratios. The conclusion is that certain cement products, sweetened mango, pickled garlic, tables, desks, chairs, cupboards and ready-made garments are worthy of promotion.

No. 19 Pradit Charsombut, "The Silk Industry in Thailand", February, 1983.

This paper is an analysis of the silk industry in terms of patterns of employment, labor intensity in production, returns to labor and firm's income. Data in the analyses are collected mainly from the survey of establishments of silk weaving plants and households at the districts of Chonnabot and Ban Phai in Khon Kaen province and Pak Thongchai in Nakornrajsima.

The paper estimates that about half a million of farm households are engaged in the silk industry with the annual production of 700 tons for native silk yarns, about 16 tons for thrown silk yarns; and about 3.5-4.5 million square meters of silk fabric are annually produced. Most of the silk fabric production are non-patterned silk fabric.

Silk production is a labor intensive industry which generates employment for family labor, hired workers and subcontractors in villages. Production of high quality patterned silk fabric and heavy weight non patterned fabric yields attractive income to producers. Markets are not a problem for these types of products. The production expansion of the high quality pattern silk fabric and the heavy weight non-patterned fabric have good potential in increasing the incomes and employment of rural people. Promotion of the silk industry in rural areas will have advantages in terms of labor cost, land for workshops and availability of raw materials supplied.

#### **Monograph**

No. 1 Tongroj Onchan, Pradit Charsombut, and Yongyuth Chalamwong, "Rural Development Policy of Thailand – Relationship between Farm and Non-Farm Enterprises", September, 1982.

#### **Conference Papers**

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

No. 2 Tongroj Onchan, "Lender Behavior in financing Rural Non-Farm Enterprises".

After reviewing key characteristics of formal lending institutions in rural Thailand, the paper highlights major problem areas. These include; the difficulty encountered by banks in implementing government lending directives, the poor record of abuses and arrears in farm credit schemes, the obstacles created by a low and inflexible interest rate ceiling, the effect of inadequate rural transport and communication infrastructure on the marketing and supervision of loans, the need for close monitoring relationship with clients, inadequacy of local bank staff, and dependence on main offices. The report concludes that banks are interested in mobilizing local savings and deposits, and that capital availability in local areas, per se, is not a problem. The banks are not, however, equipped to lend to small rural enterprises effectively. Local savings are therefore not used for local development, but are channelled back to Bangkok.

No. 3 Donald C. Mead, "Subcontracting in Rural Area of Thailand".

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

The paper takes a financial appraisal approach to determine if farm households have the ability to repay debts through liquidation of assets. The work contains very useful information which can assist lending institutions in assessing the credit worthiness of lower income clients. The information includes distribution of current, intermediate and fixed assets; composition of household income from farm and non-farm sources; distribution of outstanding debts to institutional and non-institutional lenders; annual borrowing cycles; purposes of borrowing, etc. Although the paper draws few conclusions, the data it contains can be very helpful in the design of improved rural credit schemes, if and when such schemes are deemed necessary.

No. 5 James Boomgard, "Marketing of Rurally Produced Non-Agricultural Products: A Report on Village Visits"

No. 6 Vinai Artkongham, "Profitability and Efficiency".

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

Demand is the crucial constraint to expansion of output and employment among sample firms. Other, less serious difficulties include product design, dyeing quality, shortage of unskilled labor during the wet season, scarcity of skilled labor and working capital finance. The firms are labor intensive, production is adapted to seasonal variations in labor supply, initial capital investment for entry is low, production skills are easily acquired, and output demand appears promising. For these reasons the government should consider the following potentially helpful interventions: provision of technical assistance, cultivation of certain types of co-operatives, expansion of formal credit facilities, and promotion of garment exports.

No. 8 Preeyanuch Apibunyopas, "Entrepreneurship and the Performance of Non-Farm Firms".

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

For each of model farms developed by the ROFEAP project, this paper provides an analysis of cash management practices adopted by sampled households. As in the previously-described paper, the content can be of great use in design of rural credit schemes. It also highlights the use of non-farm and off-farm cash income to finance farm enterprises, and is thus suggestive of alternatives to credit in increasing investment in farm activities. This analysis is being taken further by Adelaida Alibusan in a dissertation in preparation at Ohio State University.

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

The paper examines the financial characteristics of firms producing bricks, cement products, pickled fruits and vegetables, furniture, ready-made garments, bean curds, noodles, silk cloth and wood carvings. It recommends that banks should provide more short and long-term credit and restrict overdraft accounts, that grace periods should be permitted for long-term loans, that the rate of interest not be subsidized, and that businesses be assisted in improving their record-keeping practices.

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

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

The purpose of this study is to use generalisations from the farm modelling exercises, described earlier, to assess the impact on regional employment and income of a new technology, air dry kenaf and of variations in the price of cassava and sugar cane. It concludes that at current prices air dry kenaf generates more employment than alternatives.

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

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

While increases in rural incomes are likely to yield increasing demand for furniture, small producers in rural areas are unlikely to benefit if present trends continue. Bangkok manufacturers have a comparative production cost advantage related to their larger scale, greater capital intensity and proximity to material supplies (i.e. plywood and veneer). Smaller rural producers, if not forced out of the market, will tend to concentrate more on sales of Bangkok-made furniture. The decentralisation of government purchasing, however, may still serve to shelter small rural producers from this trend.

Policies and programs for this industry should serve the purpose of providing a supportive environment for rural producers. In this context actions in the area of raw material supplies might include: logging controls to assure a more stable wood supply, reduction of interregional price disparities for wood, decentralisation incentives for plywood and veneer plants, and wood pricing policy to encourage substitution (e.g. rattan, para-rubber wood, metal, plastic, etc.). With respect to this last, actions in the areas of training, materials procurement and investment credit may help reduce the costs of the transition from traditional to newer materials use.

Mr. James Boomgard at Michigan State University is completing a dissertation on the subject of changwat level furniture industry marketing, and additional insights and implications will be forthcoming from this work.

No. 15 Merle Menegay, "An Marketing Perspective for Village Farm Products a Basis for Discussion".

No. 16 Orasa Kiatying-Aungsulee, "Distribution of Farm, Non-Farm Enterprises in Farm Households".

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

This industry is very labor intensive and is characterized by high rates of self-employment and subcontracting arrangements which generate substantial returns to labor for higher quality products. At present domestic production is insufficient to meet demand, and the major constraint on domestic

production is a shortage in the supply of raw material. Other, less important problems include dyeing technology, pattern design, and labor shortages in the wet season. The policy and program actions which may be helpful in this context include; promotion of sericulture, improvement of skills in dyeing and design, promotion of export markets, promotion of subcontracting arrangements, promotion of filature factories, research and development on appropriate weaving machines, and modification of minimum wage and excise tax policy to maximize employment and income.

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

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

The industry is characterized by female labor intensity and seasonal variations in labor supply. Employment is maximized through subcontracting arrangements. Returns to labor range from B 8 to B 37 per day, and translate into family income generation of between B 300 and B 850 per month. Recommendations in regard to this industry include: encouragement of business and marketing leadership, improvement in rural roads, introduction of looms, skill development, formation of co-operatives and provision of credit.

No. 20 Vilailuck Thaiusa, "A Case Study on Bamboo Product Industry in Khon Kaen, Roi Et and Chiang Mai Provinces".

The market for bamboo products is at present relatively limited because the types and quality of current output is suitable only for local consumption. Expansion of employment and income in the industry will require government assistance in demonstration of new and improved product lines, training in skills required to engage in new production, introduction of small scale technologies, promotion of products to expand markets, and development of leadership and creative skills among producers. Actions to encourage bamboo planting to provide a sustained yield of material are also required. Although finance is not now a constraint on production, it would be a constraint on upgrading technology.

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

The current status of this industry is not promising. Returns to family labor are low and demand is limited for current product lines. Improvements would require identification of quality clay deposits, upgrading of types and quality of output, improvements in production technology, and creation of procurement/marketing co-operatives.

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

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

The purpose of this paper is to analyze current uses of credit to determine household preferences for credit sources and to assess the merits of formal credit expansion. It examines the extent and distribution of debt and the uses and terms of borrowing. It recommends that farmers be permitted to obtain group loans for non-farm enterprise purposes.

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

No. 25 Nongluk Suphanchaimat, "Rainfed Farm Household Modelling in Khon Kaen".

No. 26 Rapeepun Jaisaard, "Results of Farm Household Modelling in Chiang Mai".

No. 27 Somchai Thepthana, "Firm Size and Productivity: A Case Study of Brick Industry".

Larger and more capital intensive firms are more productive and can produce a wider range of outputs than smaller firms. To improve the competitive position of smaller producers, actions in the areas of clay preparation, forming and drying of bricks, and firing and removal of bricks from kilns may be helpful.

No. 28 Rangsit Pooiripinyo and Pradit Charsombut, "Mat Production in the Northeast".

Production of mats generally provides low returns to labor, about B 6 per day, although higher quality output can generate up to B 50 per day. The low returns do not encourage cultivation or seeds, and the resulting shortage of raw material acts to maintain low productivity. Therefore seed production should be encouraged and high quality mat production should be promoted.

No. 29 Vinich Veerayangkul and Merle Menegay, "Soybean Curds Processing Industry".

Curd production is highly competitive and tied to local demand. Although returns to labor are relatively good (from B 5 to B 10 per hour), prospects for expansion of employment in the future are not encouraging.

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

No. 31 Amnaj Teeravanich, "Farm Modelling in Roi Et".

No. 32 Jacques Amyot, "Institutional Support of Small Industrial Enterprises Development in Thailand".

This paper identifies and briefly describes a proposed program for promotion of small scale and home industry in a regional development framework. The program stresses new product development, new enterprise development, entrepreneurship development and improved coordination between government agencies and private efforts at the regional level, and between the region and Bangkok.

No. 33 Merle Menegay, et al., "The Noodle Processing Industries in Selected Areas of North and Northeast Province".

Major problems in the industry are labor turnover, excess machine capacity and fluctuations in input (broken rice) prices. Current trends indicate a shift in production from hand to machine processing, and from smaller to larger producers. As a result smaller rural producers are switching from manufacture to marketing of noodles. Expansion of employment will thus depend on increases in the aggregate demand for output. The government might wish to explore the export potential of dried noodles in this regard.

No. 34 Plaek Sangsingkeo, "The Wood Carving Service Cooperative: A Case Study".

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

## WORKING PAPERS

- No. 1 Merle Menegay and Vinich Veerayangkul, "Kenaf Processing in North-Eastern 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 North-Eastern Thailand", August, 1980.
- No. 4 Pradit Charsombut, "Mat Making and Fish Net Making in North-Eastern 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 Suphan Buri 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 Modelling : 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 Artkingharn, "Profitability and Efficiency : Some Preliminary Survey Results", November, 1980.
- No. 11 Jeerakiat Apibunyopas, "An Economic Analysis of Employment in Kenaf, Cassava and Sugar Cane Production and Processing in Northeast Thailand", November, 1980.
- No. 12 Yongyuth Chalamwong and Richard L. Meyer, "Wealth and Credit : A Descriptive Analysis of Farm Households Balance Sheet", November, 1980.
- No. 13 Saroj Aungsumalin, "Financial and Economic Analysis of Selected Small Scale Industries", November, 1980.
- No. 14 Rapeepun Jaisaard, "Preliminary Results of Farm and Household Modelling in Chiang Mai", November, 1980.
- No. 15 Somsak Priebprom, "Preliminary Results of a Rainfed Agriculture Model on 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-Aungsulee and Richard L. Meyer, "Distribution of Farm and Non-Farm Enterprises in Farm Households", November, 1980.

- No. 18 Preeyanuch Apibunyopas, "Entrepreneurship : A Survey Result", November, 1980.
- No. 19 Vinich Veerayangkul and Merle Menegay, "The Kuay Tiaw 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 Curds Processing Industry in Selected Areas of Chiang Mai, Khon Kaen, and Roi Et Province", November, 1980.
- No. 21 Saroj Aungsumalin, "A Study of Cement Product Industry in Three Provinces of Thailand : A Preliminary Report", November, 1980.
- No. 22 Yongyuth Chalamwong, "Economic analysis of Labor Supply of Farm Families to Non-Farm Enterprises : A Preliminary View", November, 1980.
- No. 23 James Boomgard and Merle Menegay, "A Market Systems Approach to Research on 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 and Unemployment in Farm Household", November, 1980.
- No. 27 Arnanj 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.

Present industrial policies and policy measures include investment promotion, protection and control, promotion of manufactured exports and promotion of industries in rural areas. The paper argues that these policies have been biased, in favour of Bangkok and the consequence of which has been a much lower growth rate in rural areas.

The paper proposes strategy for rural industrialization which has been classified into large scale labor intensive industries, large scale resource based industries and small scale and cottage industries. For the large scale industries, resource based as well as labor intensive, export promotion policy which include a wide range of incentives for export and correct the bias in favor of urban location would be necessary. However, availability of investment fund and location of industries should be taken into consideration as well. For small scale and cottage industries, to set up a special financial institution to provide credit together with commercial banks is recommended. Moreover, a credit guarantee scheme

and a rediscount scheme should also be organized. Apart from credit provided through financial institutions, several government agencies i.e. the Department of Industrial Promotion (DIP) should design a special program which can provide assistance in the areas of marketing, management and production technique for small scale industries.

No. 32 Saroj Aungsumalin, "Cement Product Industry in Three Provinces of Thailand", January, 1982.

Expansion of employment will depend on increase in demand for specific cement products. In this regard production of lamp poles has high potential in terms of government programs for rural electrification. Similarly, increases in demand for housing components and related infrastructure will serve to expand production of floor slabs, drainage pipes, cement blocks, etc.

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

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

This is a relatively high return industry with significant income and employment impacts. The major constraint is the availability of teak wood, and government policy with regard to management of teak reserves should be reconsidered in the light of potential and actual impact upon villager incomes. A tax on carved exports, for example, would be superior to the continued ineffectiveness of prohibitions on forest exploitation. Formation of wood carver co-operatives for procurement and marketing would also constitute a helpful step.

*ANNEX D*

**SERVICES PROVIDED BY ROFEAP PROJECT RESEARCHERS**

Services which are provided by the ROFEAP Project researchers and staff at the Center for Applied Economic Research, Kasetsart University are as follows:

- a) All the published papers which consist of research papers, conference papers, working papers and a monograph as listed in ANNEX C are on sales at the Center for Applied Economics Research, Faculty of Economics and Business Administration, Kasetsart University.
- b) All the data stored in various data files and set of magnetic tapes as mentioned in ANNEX A are available at the Center for Applied Economics Research, Kasetsart University.
- c) Handbook of procedures for using the ROFEAP data set which describes all the details of the project data is also available for reading at the Center, Kasetsart University.
- d) Documentation of all programs written by the Regional Administrative Management Center for this project can be obtained also from the Center. These programs are recorded in a magnetic tape. Lists of programs by ID number in table of contents are as follows:

*LIST OF PROGRAMS*

<i>PROG-ID</i>	<i>PURPOSE</i>
000 05	Reformats input questionnaires and correction input for updating village weekly master file.
000 06	Creates household member file containing info on each person in the village stock master file. Will be used along with weekly file to keep track of each person's work history.
000 07	Reads village weekly data file and creates listing containing number of each type of record belonging to a household. Creates some type of blank-filled file too.
000 10	Generates listing of all items from village stock (should be master file. "8"?)
000 09	Edits village stock wet season questionnaires S60, S61, S70.
000 13	Updates village household member status file and generates status report for each person for each week.
000 14	Creates village weekly household record from W20 and W30 to match against monthly file.

*LIST OF PROGRAMS (continued)*

<i>PROG-ID</i>	<i>PURPOSE</i>
000 11	Performs edit and consistency checks on village weekly master file and generates edit list for correction plus a tabulated report of errors by enumerator.
000 10 (the 2nd)	Performs edit and consistency checks on village stock master file and generates edit list for correction.
000 15	Performs edit and consistency checks on village monthly master file and generates edit list for correction, plus a tabulated report of errors by enumerator.
000 20	Edits town survey monthly questionnaire production and sales. (Minimal edit.)
000 22	Edits and updates town survey monthly master file.
000 24	Edits town stock entrepreneurship questionnaires. (Minimal edit.)
000 23	Reads town survey monthly master file and generates report request no. FEB004—labor supplementary variables: summed by month over all firms in each industry, then over all industries in a province, then over all provinces.
000 25	Prints town survey monthly questionnaires.
000 46	Creates village weekly cash flow variables, creating output file.
000 48	Creates village stock cash flow variables, creating output file (lot of unused code).
000 30	Creates supplemental variables for S10, S11, S20, S21, S30, S31, S40, S41, S42, S43, S44, S45, S46.
000 53	Prints farm modeling reports-request no. FEB001D, creates 5 output files M61, M20-1, M20-2, S10-1, S10-2.
000 51	Creates village monthly cash flow variables, creating output file.
000 50	Reads village weekly file and household member file, creating report file of an all items listing and frequency distribution. Variables V1-V7 from S10 (via the household member file) are printed in the right-most columns of the first table of data.
000 54	Reformats village weekly file and drops control and date record.
000 57	Reads village monthly file, M20 and M30 records, and assigns codes by enterprise. Generates output file, request no. FEB001 MOD.
000 56	Reads village monthly and weekly files, creating 2 files for cash flow reports.
000 58	Reads village monthly file, M20 records and creates price variable by province on 2 disc and 2 tape files.

*LIST OF PROGRAMS (continued)*

<i>PROG-ID</i>	<i>PURPOSE</i>
000 59	Reads village weekly file, W10, W11, W43 records and assigns codes by enterprise, creating file, request no. FEB003.
000 61	Reads village monthly, M30 records, and creates price variable by province and by product code, creating report file.
000 60	Reads village monthly data and generates a report listing all items, along with a frequency distribution list.
000 62	Computes and prints M20 price variables by product code.
000 64	Computes and prints M20 price variables by file number.
000 65	Computes and prints M30 price variables by file number.
000 70	Reads quarterly file of village weekly data, extracts record type 122 (W10) only, and accesses the household member file and creates labor report request number FEB001A.
000 66	Similar to program 000 50. Lists all items that were extracted by program 000 57.
000 67	Similar to program 000 60. Lists all items from program 000 59.
000 73	Reads monthly town survey file and prints report of cards 4-8, creates mag file and report file, request name MAR005.
000 71	Reads village monthly file and creates working file and report, request name FEB002.
000 72	Creates extracted file from quarter file of weekly village data type 122 only and generates labor report request FEB003. Uses household member file also.
000 74	Reads weekly village data file, creates extracted file of (W10) type 122 records and creates report MAR003. Uses household member file also.
000 76	Reads village stock data, selecting wet season questionnaire records S60, S61. Creates land variables for request no. MAR008.
000 75	Reads village monthly data, selecting M51, M52 records. Creates credit variables for request no. MAR004.
000 77	Reads (extract file 96-401 or) village weekly data, selecting W10, W11 records. Creates labor report for request no. MAR007. Uses household member file and 4 disc files.
000 95	Reads village weekly or monthly data file plus new week or month and merges them into a new file: 95-401.
000 96	Extracts merged files (weekly or monthly) based on 5 (weekly) or 6 (monthly) sets of record types placed on a parameter card. New file: 96-401.

*LIST OF PROGRAMS (continued)*

*PROG-ID*

*PURPOSE*

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- 000 97 Reads village stock file and wet season file (records S70, S71, S72?) and creates random file of biodata for each person id.
- 000 99 Reformats master files containing blocking factor of 10 and record length of 120 into questionnaire format of blocking 12 and record length 100.
- 000 98 Reads village monthly file, selecting M20 records. Creates PRICE-A value file, containing PRICE-A for each B1 and B3 by dividing sum of B8 into sum of B9. File used by prog 000 78.
- 000 78 Reads extract file 96-401 merged weekly and monthly by month and generates income report by household as request MAR002.