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The Role of Institutional Credit in Agricultural Development: The Case of the Bank for Agriculture and Agricultural Cooperatives, Thailand

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The Role of Institutional Credit in Agricultural Development:
The Case of the Bank for Agriculture and Agricultural Cooperatives, Thailand.

This thesis attempts to evaluate the lending policy of Thailand's Bank for Agriculture and Agricultural Cooperatives (BAAC) from a developmental perspective. Firstly the question of access to institutional credit is examined in terms of the distribution of BAAC loans spatially and by the economic status of borrowers; secondly, the study uses the case study approach to analyse the farm-level effectiveness of three types of lending instrument a) short-term production loans, by scale of farming operation and access to irrigation (the "credit-only" model); b) short-term production loans with extension support (the credit-extension model) and; c) long-term investment loans disbursed within the project framework (the project lending model). One of the case studies is drawn from the Central region and two from the Northeast.

The results of the study indicate that for a variety of reasons, BAAC directs subsidised loans mainly towards the country's most agriculturally productive areas and most economically secure farmers. This orientation is long-established and is likely to have contributed to the problem of inequality in the distribution of income and wealth in rural areas.

Since 1975, institutional credit has been an important part of a government strategy to increase the flow of funds and provision of support services to the rural sector. The Bank has recruited large numbers of relatively poorer farmers. However, using farm-size as a measure of economic status shows that BAAC clients generally have larger farms than

their neighbours. In the Northeastern region, the percentage of BAAC clients with farms below the median is only 11 per cent compared to 23 per cent for the Central and Eastern regions and 20 per cent country-wide. The bulk of loan disbursement is also directed towards medium- and large-scale farmers. Inter-provincial variations in the recruitment of and disbursement of loans to small-scale farmers, are explained in terms of varying strategies employed by branch managers to meet the terms and conditions of the Branch Evaluation Procedure, despite convincing evidence that repayment rates for this group are as good if not better than for larger-scale operators.

Regardless of the Bank's economic orientation farm-level analyses of the effects of short-term borrowing show that production loans are most critical to and are used most effectively by small-scale farmers, particularly those in rainfed areas. At present, however, the farm-level effect of technical support, given in association with loans to small-scale farmers, though positive, is still weak. Improvement in the impact of the credit-extension model will depend on further development of the working relationship between BAAC and the Department of Agricultural Extension (DoAE). The effectiveness of long-term project loans, in terms of increasing the productive capacity and income-generating potential among small-scale farmers, is also limited. The challenge to the Bank is to develop projects that meet the Bank's criteria with regard to financial viability and also yield a good return to the borrower after loan repayment obligations have been met.

The extent to which the BAAC can provide an equitable and effective service within the context of rural development policy as a whole, depends on active government intervention to prevent the erosion of the Bank's capital base, promotion of the type of inter-agency cooperation necessary to provide integrated support services to farmers, and prioritisation of planning for the small farm sector.

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CHAPTER I

INTRODUCTION

Despite twenty years of development planning, two of the most serious problems facing many less-developed countries are a) declining agricultural productivity and b) the persistence of poverty in the rural sector. These problems have occurred in part because of the low priority which has been given to investment in rural areas; however the problems are serious even in countries which have achieved rapid growth in the agricultural domain. Agricultural development policies have commonly been "bi-modal" in character (Johnston and Kilby, 1975), concentrating resources on the immediate development of the ecologically advanced areas and the most highly commercialised farmers. The result of "bi-modal" development strategies has often been rapid development and "reinforcing success" for selected sub-groups of farmers and impressive growth rates; while more economically-marginal farmers, in both advanced and peripheral areas, have gained little, or have actually become worse-off through the aggregate process of growth (Johnston and Kilby, 1975). Development strategies which have focussed solely on stimulating aggregate growth, on the assumption that all groups would benefit through the "trickle down" effect, have failed to achieve the desired results in terms of growth with equity.

Increasingly aid agencies have come to recognise the need for a new type of strategy to help ease rural poverty, promote more equitable development and intensify agricultural production (FAO, 1981). In order to meet this need and release the productive and income-generating potential of the small-farm sector[1], Johnston and Kilby (1975) have proposed a "uni-modal" approach to resource allocation, designed to spread the effects of development more widely, gradually uplifting the agricultural sector as a whole, and thus

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1. Generally it has been found that total output per unit area is higher on small farms, due to the greater intensity of land use. A more equitable distribution of production inputs and support services could only strenghten the role of the small farm sector in expanding production (FAO, 1981).

directly planning for, and coming to terms with, the problem of rural poverty. While it is recognised that governments' choice of development strategy is not simply a matter of opting for a "uni-modal" as opposed to a "bi-modal" approach, Johnston and Kilby (1975) argue that by paying greater attention to the distributional outcomes of alternative support policies, it should be possible to allow the small farm sector to contribute to, and attain a greater share in, the benefits of growth (Lipton, 1980). This is echoed in the approach advocated by the Food and Agriculture Organisation (FAO, 1981) which suggests that even with a moderate rate of economic growth, redistribution can have a greater impact on poverty alleviation than economic development without it. The right mix of policy measures will depend on particular national or local circumstances and, given the multiplicity of objectives which governments try to serve, will inevitably represent a compromise (Johnston and Kilby, 1975; FAO, 1981).

Agricultural credit has been an important component of rural development strategies as a tool for supporting one or a combination of national development goals including production, poverty alleviation, reduction in inequality and other socio-economic and political ends. Due to the higher costs associated with improved farming technology, it is widely held that neither the modernisation nor the commercialisation of agriculture can advance very far without adequate and reliable supplies of low-cost credit (Schultz, 1965; Mosher, 1966; Mellor, 1966). While estimates of the demand for credit are rather subjective, it is anticipated that the need for credit is likely to increase as land frontiers close, population pressures increase and farmers find that intensifying the use of land through improved technology is the only way to increase or even maintain current levels of production.

Accordingly over the last three decades, there has been a rapid expansion of the availability of credit from financial institutions funded from both domestic and external sources. Overall, formal financial institutions in less developed countries are estimated to disburse approximately US$40-50 billion annually as rural credit with approximately five per cent provided by international donor agencies (Padmanabhan, 1988). The banking network

has been extended, in some cases quite dramatically and the number of accounts with rural development banks rapidly multiplied. The aggregate amounts disbursed as loans to agriculture have increased both absolutely and in relation to loans made for other purposes and agricultural loans from formal financial institutions have displaced loans from informal sources, such as private money-lenders and traders among at least certain sub-groups of the population.

Despite their attractiveness as instruments of development policy, rural credit programmes are expensive to implement and generally incorporate substantial subsidies in one form or another. The subsidies are considered necessary in view of the high cost of administering large numbers of relatively small loans, the risk of loan default, and the perceived need to provide credit at interest rates below commercial levels to attract small farmer borrowers and encourage the adoption of improved technology. Low interest rates are also used as a means to "compensate" farmers for other policies such as those governing input and output pricing, which have worked to their disadvantage (Agabin, 1988).

Of greater importance than the aggregate amount of formal credit made available to farmers however, is the question of access to credit by geographical area and the economic level of borrowers. Credit may be made available in such a way as to reinforce and perpetuate inequalities spatially and by economic strata, or so as to reduce inequalities and contribute to the kind of "uni-modal" strategy for rural development described by Johnston and Kilby (1975). The impact of rural credit programmes will depend on the types of loan disbursed and the manner in which they are administered, that is with or without a discipline regarding use and repayment and with or without closely co-ordinated supporting services such as extension, input delivery and marketing. Poorly administered programmes which allow farmers to regard credit more as an additional source of income rather than as investment capital, may have the effect of undermining the processes associated with increased productivity and incomes at the farm-level (Adams et al., 1984). Efficiently administered and supervised credit can and should serve as an essential catalyst to rural development, particularly for those "potentially viable" farmers who often fall

through the net of available support services.

In view of the high cost of credit programmes, their perceived importance and continued popularity as instruments of development policy (Padmanabhan,1988), it is surprising that there have been relatively few objective analyses of their developmental impact. This study considers the question of access to institutional credit and its farm-level effects in Thailand, a country which has experienced an expansion of agricultural credit similar to other parts of Asia. Attention is focussed on the activities of the Bank for Agriculture and Agricultural Cooperatives (BAAC), Thailand's leading source of rural credit and one of the main institutions through which the Royal Thai Government (RTG) is attempting not only to promote agriculture, but also to deal with the problems of poverty and inequality in the rural sector.

BAAC was established in 1966 for the specific purpose of channelling agricultural credit to the agricultural sector. Until that time credit was available to farmers predominantly through the informal or non-institutional sector. This however was considered to be an inadequate basis for the modernisation of Thai agriculture due to the exploitatively high interest rates charged and loan funds assumed to be too limited for the types of short- and long-term investments deemed necessary to advance technical change. Commercial banks were scarcely involved in rural lending at this time; up to 1975, less than two per cent of commercial loans went to agricultural ventures (Bank of Thailand, 1980). Since 1966 BAAC has continually expanded its lending operation. By the end of fiscal year (FY) 1989, the Bank had 71 full branches[1], and 47 district branches[2] and credit services were operating in 742[3] districts and sub-districts throughout the country. Over 2.8 million farm families were registered to borrow from the Bank, including 1,897,525 as direct clients,

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1. Generally one branch per province, although some provinces have two.

2. In FY1989 22 field offices were upgraded to district branch status.

3. Of which thirteen were new operating areas for the bank.

833,771 through Agricultural Cooperatives and 84,145 through Farmers' Associations, amounting to 54 per cent of the estimated number of farm families in the country (BAAC, 1990). A further 300,000 farm families were registered with commercial banks (BAAC, 1989). Total disbursement during FY1989 was 33,823 million baht, about 82 per cent (28,013 million baht) of which was directed to individual clients, 17 per cent (5,794 million baht) to Agricultural Cooperatives and less than one per cent (5,794 million baht) through Farmers' Associations.

BAAC differs from the commercial banks in that it is supported and in part financed by the government. Funds are channelled through the Bank from both governmental and private sources for on-lending to direct clients and farmers' institutions. BAAC is required constitutionally to provide loans at governmentally determined interest rates, which are below those of commercial lenders; and in many cases is required to operate a programme which would not be considered viable from a financial point of view. On the other hand in order to continue the operation, the Bank has to maintain its financial stability and its rapid expansion has depended heavily on the maintenance of discipline among borrowers, particularly with respect to loan repayments. BAAC is thus essentially a hybrid organisation, concerned with both strict financial discipline and the broad social and economic issues of development which often conflict. It is a typical example of the type of public development bank defined by Kane (1975).

In spite of BAAC's rapid growth and undoubted importance as an instrument of rural development policy, there have until recently, been very few objective studies of the developmental effects of the Bank's activities. In this respect it is not unlike most other rural development banks in Asia. The Bank's own analyses have concentrated mainly on solving operational problems and measuring and improving rates of loan repayment. These are understandable concerns, consistent with the need to maintain efficiency and the financial viability of the organisation; and by the repayment criterion, BAAC has been relatively successful in managing to maintain and improve repayment rates while expanding the scale and scope of the operation into more economically marginal areas and the range of lending

instruments and support services on offer.

However, there has long been a clearly recognised need for a more detailed and objective analysis of BAAC's operations in terms of a) the degree of access provided to different groups and b) the effectiveness of the various types of lending instrument currently in use to increase productivity and incomes at the farm level. Performance in this respect is much more difficult to measure since a number of questions must be considered:

a) What are the distributional implications of BAAC's lending operation spatially and by the economic level of borrowers[1]? Are BAAC's activities more consistent with a "uni-modal" strategy which seeks to reduce spatial and economic inequalities, or with a "bi-modal" approach which fosters and exacerbates the problems of inequitable growth and asset accumulation?

b) How are production loans utilised within the farm-household economy and how do they affect agricultural productivity in terms of encouraging farmers with varying resource endowments to invest in improved farming technology?

c) Are production loans in isolation sufficient to bring about developmental change at the farm level? How effective are other types of lending instrument which incorporate support services in improving productive capacity and incomes for small-scale farmers?

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1. D.W Adams (1988) gives five criteria against which to judge the performance of rural credit programmes:
   1) The number and proportion of rural people with regular access to formal loans and deposit services;
   2) the amount and distribution of transaction costs involved in financial intermediation;
   3) the extent to which financial intermediaries are self-sustaining and generate enough revenue to cover operating costs, losses due to default and capital erosion due to inflation;
   4) recovery performance;
   5) the extent to which RFMs are able to mobilise funds in rural areas.

In this study, the question of access is examined using secondary data on recruitment, disbursement and repayment collected from BAAC's Head Office and branches and from localised surveys. The question of the farm-level effectiveness of loans is examined through a series of case studies, each focusing on a particular type of lending instrument. These are:

a) The "credit only" model; case study from Chainat province, Central Thailand;

b) the "credit-extension" model; case study from Ubon Ratchathani province, Northeast Thailand;

c) the "project lending project" model; case study from Loei province, Northeast Thailand.

Chapter II continues with a review of agricultural credit programmes in less developed countries (LDCs) in the context of questions raised in the literature concerning their effectiveness. Chapter III provides an overview of the agricultural sector in Thailand and the mix of policy measures introduced by the RTG to deal with the problems of declining yields and increasing spatial and economic inequality. Chapter IV describes the various components of the rural financial market (RFM) in Thailand and then focuses on the structure, policies and performance of BAAC. Chapter V examines the question of access to BAAC loans and inequalities in recruitment and loan distribution spatially and by the economic level of borrowers; and builds a case for increased BAAC lending to the small farm sector.

Chapter VI provides an introduction to the first of the case study areas in Chainat province and to the institutional and agro-economic framework within which farmers in the study villages in tambons (commune), Nang Lue (Muang district) and Nong Noi (Watsing district) were operating in 1980/81. The chapter also gives an account of the research methodology employed in the household survey and goes on to describe the general farming characteristics of the sampled farmers including their cash flow situation during the 1980/81 agricultural year and use of loans for seasonal production and investment. Chapter VII uses path analysis, a form of regression analysis as a means to assess the direct and indirect

effects of short-term production loans (the "credit only" case) on the use of farm inputs and productivity levels among the sampled households. The analysis is carried out for both the irrigated (Nang Lue) and the rainfed area (Nong Noi) and again separately for small-, medium- and large-scale farmers in each location to test for variations in the effects of loans by farm-size category.

Chapter VIII provides an introduction to the Northeast Poor Farmers' Scheme, funded by the European Community (EC) and operated by BAAC since 1985. The chapter describes each component of the scheme and then focuses on the Small Farmers' Recruitment and Servicing Project (Sub-Project 1) which aims to provide credit-extension packages specifically tailored to the development needs of small-scale farmers. The chapter also discusses problems and constraints encountered in implementing the project from 1987/8 to 1989/90 in Ubon Ratchanthani (Ubon) province, Northeast Thailand. Chapter IX uses survey data collected in Ubon to describe the agro-economic characteristics of a small sample of project farmers and any changes in farming practice, output and contact with support service which took place during the first effective year of project operation, 1989/90. This chapter proceeds to use the same data to develop and test a simplified "credit-extension" model to assess the relative importance of credit and technical assistance as determinants of the use of inputs and productivity for rice.

Chapter X introduces the third type of lending instrument under study, namely the provision of long-term development loans within the "project format". Attention is focused on the EC-funded Fruit Trees and Bamboo Project in Loei province, Northeast Thailand. The chapter discusses BAAC's experience in term lending, the advantages and disadvantages of the project format and the progress and problems encountered in implementing the project from 1987 to 1990. Following a brief discussion of the agro-economic characteristics of the sampled farmers, Chapter XI uses financial analysis to evaluate the effectiveness of long-term project loans as a means to increase the income-generating capacity of small-scale farmers.

The final chapter draws conclusions regarding the equity and effectiveness of BAAC's operations and the extent to which the Bank can be said to be contributing to a uni-modal approach to rural development in Thailand, through a) providing access to increasing numbers of poorer farmers; b) maintaining its own financial viability and c) the effectiveness of different types of loan in supporting developmental change. Based on the results of the study, recommendations are made concerning future directions for the Bank and the manner in which loans should best be administered to yield maximum benefits for the small farm sector.

CHAPTER II

RURAL CREDIT PROGRAMMES: PROBLEMS AND PERFORMANCE

2.1 Introduction

This chapter reviews the problems and performance of rural credit programmes as instruments of rural development policy in less-developed countries. Following an introduction to the key issues, the chapter addresses four main questions:

1) To what extent are farmers constrained from adopting innovations by shortage of capital?

2) Is credit being made available to those farmers who need it most and could use it most effectively to improve their economic status?

3) What is the demand for rural credit?

4) Is institutional credit being used effectively among those farmers currently eligible to receive it and what are the constraints to effective usage?

2.2 The Rationale for Rural Credit Programmes

Since the 1960s rural credit programmes (RCPs) have come to play a leading role in the agricultural development policies of many less-developed countries. The main aims of such programmes have been to provide farmers with capital to increase productivity and incomes in rural areas, encourage the adoption of modern technology, lessen farmers' dependence on private money-lenders and help alleviate rural poverty. RCPs are seen by governments and donors as a convenient channel for external finance, for redirecting funds from other sectors of the economy into agriculture and as being easier to administer than many infrastructural, extension or welfare programmes (Adams, 1977; Adams and Graham, 1979; Von Pischke, 1980a; Ladman and Tinnermeier, 1981). Traditional RCPs are characterised by concessional interest rate structures and heavy government subsidies which are justified as necessary incentives to encourage farmers to borrow, to compensate the rural sector in some measure for the adverse effects of product pricing policies (Agabin, 1988), and to help improve rural income distribution (Adams, 1977; Von Pischke, 1980a, Von Pischke et al., 1983).

Accordingly, over the last thirty years, governments throughout the Third World have overseen a rapid expansion of the availability of farm credit, financed from both domestic and external sources. Formal financial institutions in less developed countries are estimated to disburse approximately US$40-50 billion annually as rural credit with approximately five per cent provided by international donor agencies (Padmanabhan, 1988). The banking network has been extended in many countries, in some cases, quite dramatically. For example, in Sri Lanka there were only 14 rural banks with 54 branches in 1961. By the end of 1978, the People's Bank alone had opened 217 branches, while the Bank of Ceylon, which had only 100 branches in 1973, had opened a further 400 branches by 1975. In the Philippines 520 rural banks, including branches and field offices, were established from 1966 to 1975 (APRACA, 1981). The number of accounts with rural development banks similarly increased, for example by 36 per cent in Indonesia during the period 1975 to 1980 (APRACA, 1981). The aggregate amounts disbursed as loans to agriculture have increased both absolutely and in relation to loans made for other purposes. The Philippines experienced one of the most dramatic increases in loan disbursement, with a 45 per cent increase in real terms between 1978 and 1979 alone (APRACA, 1981). Table 2.1 shows the growth rates of disbursement in agricultural loans in selected Asian countries during the early 1980s.

Agricultural loans from formal financial institutions have also rapidly displaced loans from informal sources, such as private money-lenders, among at least certain sub-groups of the population. For example in the Philippines, non-institutional credit amounted to 90 per cent of total production credit from 1950 to 1960. By 1981, four banks including the Rural Bank, the Land Bank and the Development Bank of the Philippines were estimated to provide 90 per cent of the total agricultural credit needs of Filipino farmers (APRACA, 1981). In Thailand, the percentage of farm-households borrowing informally declined from 66 per cent in 1970/1 to 34 per cent in 1982/3. Table 2.2 shows trends in the relative shares of non-institutional lenders in selected Asian countries.

Table 2.1: Growth Rates for Farm Loans, Selected Asian Countries

Country	Period	Growth rates Nominal	Real	Remarks
China, Rep. of	1979-84	20.2	13.3	Total instit. loans outstanding
India	1980/1-1983/4	14.5	3.6	Annual disb. of NABARD loans
Japan	1980-84	7.7	6.7	Total borrowings/ farm household
Korea, Rep of	1980-84	29.1	18.4	Annual disb. of all instit. farm loans
Pakistan	1980/1-1984/5	40.7	31.4	Annual disb. of ADBP loans
Philippines	1980-83	10.4	- 1.3	Annual disb. of all institutional farm loans
Sri Lanka	1980-84	28.8	14.5	Annual disb. of CRCS cultivation loans
Thailand	1980-84	27.4	20.0	Annual disb. of all commercial banks and BAAC loans.

Source: Egaitsu (1988) in Country Reports for the Asian Productivity Organisation Seminar on Farm Credit in Asia, 1988.

Table 2.2: Trends in Relative Shares of Non-Institutional Lenders, Selected Asian Countries

Country	Relative Share Year	%	Year	%
China, Rep. of	1952	64.0	1983	12.0
India	1950/1	97.0	1984	45.0
Japan	1935	56.0	1984	12.5
Korea, Rep. of	1971	69.0	1982	26.1
Nepal	1969/70	81.9	1976/7	76.0
Pakistan	1956	72.1	1970/1	44.5
Philippines	1953	82.6	1978	38.6
Sri Lanka	1978/9	79.3	1981/2	59.7
Thailand	1970/1	65.6	1982/3	33.8

Source: Egaitsu (1988) in Country Reports for the Asian Productivity Organisation Seminar on Farm Credit in Asia, 1988.

The rationale behind most governments' continued support for rural credit programmes has been summarised by Von Pischke (1980a) as the "Public Sector Farm Credit Complex", which consists of four related assumptions about the economic status of farmers and governments' role in rural development:

a) Farmers are poor, face capital shortages and have no option but to enter into exploitative relationships with private money-lenders to meet their farm and household expenses.

b) Agricultural innovation cannot occur along desired lines without access to low-cost credit, since farmers' savings are insufficient to cover the additional costs of modern inputs.

c) Supplying funds in advance of demand will stimulate farmers to take financial risks and thereby accelerate the adoption of technical innovations and farm investment.

d) It is the responsibility of the government to promote rural development, particularly for the poor.

Criticism of this strategy began to emerge in the late 1960s, at a time when the results of various empirical studies and project evaluations revealed that the majority of RCPs had failed to achieve their objectives in terms of reaching small rural producers and improving yields and incomes. In 1973, the USAID Spring Review of Small Farmer Credit brought together over 60 credit project evaluation reports from 37 countries, the results of which indicated that the traditional model encapsulated by the Public Sector Farm Complex was over-simplified. Rural credit was recognised as being only one of several support services necessary to promote rural development and the "supply-leading" notion on which programmes were based (Patrick, 1966) was seen as unrealistic in the sense that it took no account of investment opportunities, credit-worthiness, or to define borrower eligibility. In some countries default rates and administrative costs had increased to the point where the financial viability of many government banks was being seriously undermined (Boakye-Darkwa, 1979, Von Pischke et al. 1983; Adams et al. 1984, Padmanabhan, 1988). The World Bank Sector Policy Paper released in 1975 summarised the current dilemma as

> "the need to learn much more about the most appropriate channels for providing credit at low cost to enable large numbers of small farmers to become productive" (p.17).

The Spring Review (1973) sparked-off a large number of other studies, leading to the emergence of a new school of thought in rural finance which reinforced the opinion that the assumed benefits of RCPs were mainly illusory[1]. In contrast to the traditional "farm finance" view, the new school focuses on rural financial markets as a whole, which embrace all relationships between formal and informal buyers and sellers of financial assets active in rural areas[2] (Egaitsu, 1988; Padmanabhan, 1988). The main cause of the problems, it is argued, is the artificially low interest rates which have bred rationing against small rural producers (Gonzalez-Vega 1977; 1984) and made it difficult for institutions to generate enough capital to cover administrative costs (see section 2.4.1). Moreover low interest rates are seen to have discouraged savings mobilisation in rural areas, which has led to over-reliance on cheaper sources of external funding and the under-development of the rural economy (Von Pischke et al, 1983; Adams et al. 1984).

Thus rather than reducing inequalities in income distribution in rural areas, numerous studies demonstrate that rural credit programmes have had the opposite effect. The bulk of the available funding appears to have gone to economically-secure operators who have unduly benefited from the implicit subsidies intended for small-scale farmers (Adams, 1977; Gonzalez-Vega, 1977, 1984; Lipton, 1976; Adams and Nehman, 1979; Webster, 1986) (see section 2.4.2). While RCPs are frequently included as part of a mix of policies designed to promote a more equitable approach to development

> "there is a tendency for bi-modal strategies to persist, characterised by a dualism between large commercial farms in receipt of public subsidy and other incentives and small farms practising traditional methods and stagnating due to lack of extension, finance and other stimulants to growth" (Webster, 1985, p.2).

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1. The Agricultural Credit and Savings Program at Ohio State University in the USA and the World Bank both played a leading role in forging the new consensus.

2. Rural financial markets are made up of all who take part in financial intermediation in rural areas including formal institutions such as commercial banks, development banks, cooperatives, farmers' associations and all rural households who lend or borrow money.

Overall, critics argue that the costs of rural credit programmes frequently do not justify the benefits in terms of improved productivity and welfare for small-scale farmers and, with prevailing low interest rates, have no potential for improving rural income distribution (Von Pischke, 1980, 1983; Gonzalez-Vega, 1977, 1984; Donald, 1976). The programmes have been described as "anti-developmental" in the sense that they may lead to

> "a very inefficient allocation of resources, seriously discouraging the capital formation process...." (Adams, 1977, preface).

To help solve these problems, the RFM school of thought argues for more flexible interest rate policies and the implementation of credit programmes which pay little or no attention to targeting, place more emphasis on voluntary savings mobilisation and give greater access to loans for non-farm activities[1] within the context of a supportive input and output pricing policy. Such an approach, it is argued, would be considerably more effective in stimulating rural development than existing quota-led subsidised credit programmes (Von Pischke et al., 1983; Adams et al., 1984).

Padmanabhan (1988), on the other hand, is of the opinion that the "farm finance" school, which emphasises the need to channel credit through well planned projects[2] and the "RFM" school[3] which focuses on institutional viability and the removal of subsidies, are not necessarily irreconcilable. The author argues that the appropriate mix of policies depends on the situation within individual countries. Removing interest rate ceilings is likely to have wide ramifications throughout an economy and is not easily accomplished in the short term, especially where special interest groups influence resource allocation decisions:

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1. Rural banks are often reluctant to finance non-farm activities, traditionally the realm of commercial banks, even though in some countries between 40 and 60 per cent of total family income comes from off-farm sources (Meyer, 1980; Akransee, Onchan et. al., 1983; Von Piskche et. al., 1983; Meyer and Abuliscan, 1984).

2. The approach still supported by the International Fund for Agricultural Development (IFAD).

3. Supported by USAID and the World Bank.

"Allowing a free play of market forces may not necessarily meet the equity objectives in an economy with marked inequalities in income, wealth and skills" (Padmanabhan, 1988, p. 30).

Instead the author advocates a gradual increase in interest rates alongside paying greater attention to applying "counselled credit" to new investment opportunities, including credit for non-farm purposes. Rural banks also need to increase the range of services on offer to the rural sector, especially in savings mobilisation and make efforts to reduce transaction costs for both the borrower and lender (see section 2.4.3).

This chapter now proceeds to consider in more detail evidence related to the four basic and inter-related issues pertaining to the role of institutional credit in rural development listed above.

2.3 Capital as a Constraint on Innovation

In view of the official or unofficial closure of the land frontier in many less developed countries, the growth of agricultural output now depends upon the intensification of the production process. It has been widely held that low-cost institutional loans are necessary to help farmers meet the additional costs of using improved technological inputs. However relatively few empirical studies have directly examined the extent to which credit shortages constrain the adoption of technical innovations. The descriptive accounts available present conflicting views in this regard: Donald (1976) cites evidence from a number of country studies carried out for the USAID Spring Review (1973), to show that credit is not always a constraint on adoption rates. Much depends on the level of technology under which farmers operate, the opportunities for productive investment and whether or not they have access to irrigation. Subsistence farmers using traditional technology under rainfed conditions have been found to allocate their resources in a rational manner, and even if credit were available, would be unable to increase output through the additional use of inputs due to the limitations of the physical environment. Eckert (1971) for example discovered that having achieved optimal levels of fertiliser use with native wheat varieties, traditional farmers in Pakistan saw few

opportunities for increasing output under existing technology. Similarly in Brazil, Meyer (AID Spring Review, 1973) found that it was not possible for farmers to use fertiliser profitably on many crops because of the low productive potential of the soil. Traditional farmers have been found unwilling to use their own or borrowed funds for farm improvement where increased returns cannot be assured. For example, in Northern Sumatra, Penny (1968) noted that most farmers were reluctant to use their savings for farm investment because of weak economic incentives and a high risk of natural disaster.

By contrast, various other authors have reported instances of farmers adopting technical innovations by using their own or locally borrowed funds. Tiffin (1974) for example noted the widespread purchase of new ploughs among traditional farmers in Northern Nigeria who did not have access to institutional loans. Other examples include studies in Pakistan and India cited by Long (AID, 1973), and from the Muda River Scheme in Malaysia (Gillette and Uphoff, AID 1973). In India and Pakistan, Lipton (1976) reported widespread adoption of new technology among poor farmers despite the lack of credit:

> "In the mid-1960s a credit constraint was diagnosed in Pakistan; later however across the Punjab new seeds (and associated costly fertiliser) have spread to most wheat farmers including small ones (0-5 acres)" (Lipton, 1976, p. 544).

From studies in Africa the same author concluded that "scarcity of capital seldom constrained farm growth, at least in the aggregate" (Lipton, 1976, p. 545).

Such findings lend support to Bottrall's (1976) hypothesis that formal credit may be unnecessary at the adoption stage of a new technology if farmers have sufficient economic incentive to change. In view of the great strides that have been made in the adoption of highly divisible inputs such as new seeds, and the relatively small numbers of farmers receiving formal credit, it is reasonable to conclude the adoption of most agricultural innovations, at least in the early stages, does not depend upon the availability of formal loans. Bottrall (1976) and Howse[1] (1974) conclude that by inducing change in small steps and

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1. Howse (1974) noted the highly successful promotion of savings clubs to finance farm inputs in Zimbabwe, Lesotho, Zambia and Malawi.

encouraging saving, farmers can be taught to depend exclusively on their own resources at least in the early stages of adoption. Roberts (1972) and Penny (1968) suggest that in the initial stages, lack of technical knowledge is a more important constraint upon the adoption of improved technology than lack of capital, even among commercialised farmers. Similarly in Zambia, Roberts (1972) found that where the productive potential of a new technical input was not immediately obvious, adoption was unlikely to occur without substantial extension advice. Farmers had to be taught about commercialised farming and the profitability of new technical inputs in order to foster the desire to invest more capital in farm improvement.

While very few studies investigate the inter-action between credit and extension at the farm level, the majority of authors on extension emphasise the importance of credit to increase the effectiveness of such programmes (World Bank, 1985; Adams, 1982; Howell, 1988; Heim, 1986). Adoption of new technology is seen to depend upon the interaction of a number of factors including the organised supply and use of inputs, provision of technical advice, credit, stable prices and secure markets. From a study comparing autonomous extension programmes with known cases of agricultural progress in 13 Latin American countries, Adams (1982) concluded that "on its own, extension led to no observable progress" (p.99). However, where extension had been integrated successfully with input supply and credit, the results were positive. For example considerable progress was made in raising rice yields in Indonesia through a combined extension-credit-input approach (World Bank, 1985). However the potential beneficial effects of credit on farmers' uptake of extension messages cannot be relied upon because extension programmes usually lack such a support system[1]

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1. This is due in part to the way in which extension programmes have evolved in particular countries. In Thailand for example where a full-scale and autonomous extension programme has been in operation since 1977, the credit and supply aspects of technical transfer are administratively separate from the extension function and little institutional effort has been made to coordinate the parallel functions outside the "special project" context (World Bank, 1985). This problem is particularly serious in African countries where the private sector supply and marketing networks are not sufficiently well organised to complement public sector extension activities (World Bank, 1985).

and there is usually no established working relationship between the two institutions concerned (see Chapter VIII).

Aside from the question of extension support, a further group of studies demonstrate that the full adoption of improved inputs, for example, high-yielding varieties plus adequate amounts of fertiliser, is heavily constrained by the availability of funds (Agarwal and Kumawat, 1974; Mehotra, 1978; Naseem, 1975). From a study of irrigated and rainfed farms in Surat district India, Schulter (1974) concludes that the income of small-scale farmers was constrained more by credit supply than by the desire to avoid risk and the accumulation of debt. Certainly the costs involved in using modern methods are higher than for traditional practices, and small farmers in particular may have insufficient disposable funds of their own to undertake such changes. Lipton (1976) notes that in India, the cash requirement for new wheat varieties was twenty-five pounds sterling per acre compared to only nine pounds for traditional varieties, while Lowdermilk (AID Spring Review, 1973) found that 75 per cent of sampled farmers in the Pakistani Punjab had insufficient funds to purchase the required amounts of fertiliser. David and Meyer (1979) conclude from the results of credit impact studies in various parts of the world (see Chapter VII), that access to low-cost institutional loans is normally associated with increases in the use of modern inputs, but caution that it may not necessarily result in higher levels of income (see section 2.5).

2.4 Allocation Policies

Implicit in the foregoing discussion is the question of the extent to which low-cost institutional loans are reaching the desired target groups; those for whom lack of finance is a constraint on investment in improved inputs, as opposed to those who could afford to finance production from their own resources. Although there has been a remarkable increase in the volume of loans disbursed through specialised institutions on a global scale, the percentage of farmers with access to institutional credit varies widely by country. In certain African states in 1975, only one per cent of farmers were registered institutional borrowers, compared to five per cent in Africa as a whole, 15 per cent in Latin America and

Asia (excluding China) and almost all households in Taiwan (World Bank, 1975). By 1984, 17-20 per cent of the farm-households in Bangladesh were reported to be served by institutional sources; 50 per cent in India, 24 per cent in Nepal, 80 per cent in Pakistan and about 20 per cent in Sri Lanka (APRACA, 1984).

Moreover, there is accumulating evidence to show that farmers with access to institutional credit are usually not among the poorest in the rural community. In practice, due to formal lenders' strict eligibility requirements and the desire to minimise risk, rationing is employed to the extent that loans tend to go to farmers of above-average economic status who are considered to have a higher "absorptive capacity" for credit and greater ability to repay (Webster, 1986). For example, of the ten per cent of households with access to institutional credit in Honduras in 1977, the top nine per cent received 81 per cent of the total money loaned (Gonzalez-Vega, 1977). In India, Lipton (1976) estimated that only 27 per cent of total institutional credit went to farmers with less than two hectares between 1969 to 1970 despite farming 80 per cent of the arable area. In an analysis of credit flows to different Indian states between 1974 and 1975, Haque and Maji (1978) show that 54-59 per cent of total credit went to large-scale farmers in Mahastra and Madhya Pradesh states. Despite the large increases in coverage, the World Bank estimated in 1975 that in most less-developed countries 70-80 per cent of small-scale farmers, defined as those with less than the local average farm-size, did not have access to institutional credit.

There are three possible explanations for low levels of small farmer participation in institutional credit programmes, two of which relate to aspects of lender behaviour and one to borrower behaviour. Each is discussed below:

2.4.1 Access and interest rates

Outwardly, the main justification for the use of concessional interest rates is to demonstrate government concern for the plight of the rural poor and to encourage farmers to borrow from formal institutions as against informal lenders who charge exploitatively high interest rates. In practice interest rates are fixed below commercial levels chiefly for political reasons (Von Pischke, 1980a, Von Pischke et al. 1983; Ladman and Tinnermeier,

1981; Agabin, 1988; Padmanabhan, 1987). According to the RFM school of thought, concessional interest rate policies tend to exacerbate rather than improve inequalities in the distribution of income and assets in rural areas by restricting rather than encouraging small farmers' access to institutional loans (Von Pischke, 1980a; Adams, 1977; Adams, 1978c; Gonzalez-Vega, 1977; 1984). Low interest rates generate excess demand for credit from all types of farmers, and as funds are generally limited, lenders employ various non-price rationing mechanisms to steer lending away from what is seen as the high risk end of the market. A second justification for rationing is to reduce transaction costs which are disproportionately high for small loans (Gonzalez-Vega, 1977). Such measures result in relatively large-scale and economically secure farmers benefiting disproportionately from government subsidies ostensibly ear-marked to assist the small farm sector (Webster, 1985). In some countries institutional borrowers may even realise net income transfers due to the negative rates of interest paid in real terms (Adams, 1977; Adams and Nehman, 1979; Gonzalez-Vega, 1977).

Low interest rates, together with large increases in the supply of credit, foster the belief that funds will eventually "trickle down" to poorer farmers. As yet there is no evidence that this is the case. Adams and Tommy (1974) found, for example, that very little of the three-fold increase in formal credit disbursed in Brazil from 1965 to 1969 filtered down to small-scale borrowers. Out of the 388 farmers surveyed in one area of Southern Brazil, the largest eleven farmers in terms of farm-size, constituting three per cent of the sample, received over two-thirds of the increase in disbursements to the whole group over the five year period. From a study of technical innovation among 1,686 farmers in Sao Paulo in 1971, Sayad (1979) found that short-term credit was quite evenly distributed between farm-size categories; however formal long-term loans were highly concentrated among large farmers with greater liquidity reserves.

One further effect of concessional interest rate policies is that they tend to discourage other types of rural banking activities that would benefit the population. In particular low interest rates discourage savings mobilisation that could increase the volume

of funds available for rural lending and reduce reliance on external sources of funds (Adams, 1978c; Von Pischke et al., 1983). In Taiwan the policy of adjusting interest rates on savings and loans to their real value encouraged rural households to deposit large amounts with financial institutions, which in turn funded loans to larger numbers of farmers and provided the financial base for other activities within the farmer groups. The experience of Taiwan in this respect demonstrates that rapid and equitable economic growth is possible to achieve when commercial interest rates are charged (Irvine and Emery, 1966).

Vogel (1983) and Gonzalez-Vega (1983) consider that interest rate reform would have the effect of increasing loan access for small-scale borrowers by removing part of the need for rationing by lending institutions. It would increase rural savings, speed up the capital formation process and reduce unfair subsidies to large borrowers. Removing the ceiling on interest rates they argue would also ease the burden on financial institutions implementing rural credit programmes by allowing them a larger margin within which to cover the high administrative costs involved in the widespread disbursement of relatively small loans (Von Piskche et al., 1983, Adams et al., 1984, Padmanabhan, 1988).

2.4.2 Rationing

Von Pischke (1980a) distinguishes between two main types of rationing practised by rural credit institutions, intensive and extensive. The former involves allocating large amounts of credit to carefully selected, economically-secure farmers to encourage productive investment in the farm; for example to finance the switch from native varieties to HYV-fertiliser technology, or to replace buffaloes with a tractor. The objective of this type of rationing is to increase farmers' productivity and income levels to the point where the loans plus interest can be repaid from the "incremental cash flow" generated by the investment.

Extensive rationing by contrast involves supplying a large number of small loans to broad target groups, for example to all members of an agricultural cooperative or farmers' group. Borrowers must meet the institutions' usual eligibility requirements, but the amount of credit they receive is considerably lower than under intensive rationing.

In Von Pischke's words, since such loans are frequently too small to affect production practices, this type of rationing is

> "motivated by considerations of access and the intention on the part of the government to inspire broad support" (Von Pischke, 1980a, p. 92)

rather than to improve farmers' income. Small-scale farmers, particularly those in ecologically marginal areas, are the group most likely to be subject to extensive rationing. Because the cost of administering each loan is fixed, the procedure tends to increase lenders' operating costs which become disproportionately high when the average loan size is small.

A third type of rationing discussed in the context of Colombia by Vogel (1977), occurs where credit is made available only for certain crop types. Vogel attempted to evaluate the success of government rationing mechanisms in stimulating the production of particular crops. The author found that despite the lending quotas set, planners were unable to exert any influence on the allocation of credit among different seasonal crops because their recommendations disagreed with lenders' assessment of the absorptive capacity for credit among the targeted crops. The lending agencies perceived this capacity to be highest among large-scale commercial farmers who received the bulk of available credit. The findings of this study demonstrate that without direct government intervention, it is very difficult to alter lenders' bias against lending to small-scale farmers, even though the potential benefits in terms of increasing the productive capacity of this group[1] and progressing towards national developmental goals for the rural sector may be considerable.

2.4.3 Borrowing costs

A further group of studies attempt to explain low credit utilisation among small-

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1. According to the "Sen" principle, small farm units operating labour-intensively under close paternalistic supervision and offering family workers the average product of their labour to produce at a given level of technology, produce more output per unit of inputs than do larger units. The "Sen" effect as applied to RCPs suggests that a) rates of return to extra credit where it finances additional productive investment would be greater on small farms; and b) defaults would be a lower proportion of total loans for smaller borrowing units (Lipton, 1980).

scale farmers in terms of the behaviour of borrowers rather than the behaviour of lenders. Borrowing costs are disproportionately large relative to loan amounts for borrowers of small amounts, which is likely to adversely affect willingness to seek loans from formal lenders. Total borrowing costs (BC) comprise three main elements: normal interest (NI), transaction costs (TC) and changes in the purchasing power of money (P)

$$BC = NI + TC - P$$

Adams and Nehman (1979) cite studies in Bangladesh, Brazil and Colombia to show that transaction costs, comprising application fees, service fees, bribes, the cost of repeated trips to town to negotiate, receive and repay loans, and the opportunity cost of work time lost, make up a higher proportion of total borrowing costs for small and inexperienced borrowers than for borrowers of large amounts. In Brazil, Nehman (1971) found that many new borrowers had to visit formal lenders between five and seven times to complete a loan transaction, while for more experienced borrowers only a telephone call was necessary. Small borrowers had to pay on average 109 cruz to acquire a loan of 680 cruz; while larger borrowers paid only 144 cruz to acquire 6,800 cruz.

Interest rates, on the other hand, comprise a higher percentage of total borrowing costs for larger borrowers. For example in Bangladesh, Shahjahan (1968) calculated that interest payments comprised only 17 per cent of total borrowing costs over a year for small borrowers compared to 57 per cent for large borrowers. However total borrowing costs as a percentage of loan size decreased sharply for larger loans. Moreover Nehman (1971) found in Brazil that the combined effect of variations in total borrowing costs by loan size and the general price inflation, allowed large-scale borrowers to realise negative real interest rates on institutional loans, while small borrowers effectively paid interest at substantial rates.

Considering the results of these studies, Adams and Nehman (1979) conclude that when transaction costs are taken into account, the net cost of institutional loans for small-scale borrowers is very similar to the amount charged in interest by informal commercial lenders. This may explain in part why many poor farmers prefer to borrow informally;

transaction costs are minimal, cash is readily available and very often there are no formal security requirements. One way to increase the likelihood of small-scale farmers seeking access to institutional loans would be to reduce transaction costs and simplify application procedures. If this could be achieved, increased interest rates, given that they comprise a smaller outlay for small borrowers, should not greatly affect their willingness to borrow from formal sources. Arguments such as these support those in favour of more flexible and realistic interest rates on institutional loans which properly reflect the true cost of lending (Adams and Nehman, 1979).

To summarise, a number of factors have been discussed which serve to restrict the access of the rural poor to the potential benefits of rural credit programmes, and place them in a steadily worsening position in terms of income and asset distribution. While RCPs in isolation can do little to improve the productive capacity of small-scale farms, it seems likely that credit, channelled in association with extension advice or within the project framework, does have the potential to improve the productive capacity of the small farm sector. The remarkable success of the Grameen Bank in lending to poor landless farmers in Bangladesh is evidence of what can be achieved through careful and imaginative planning. As Lipton (1976) points out, the reasons for the low participation of small farmers in the formal credit market should not be taken as justification for their exclusion.

2.5 The Demand for Agricultural Credit

The demand for farm credit may be conceptualised in three different ways: "effective" demand, "latent" demand, and "expressed" demand. The "effective" demand for credit refers to the amounts actually borrowed by farmers to finance their farming activities, both from formal and informal sources. This is to use the word "demand" in a narrow sense, since there are likely to be farmers who at present borrow either more or less than the amounts which would maximise their profits, or which they think they need. The "latent" demand for credit refers to the amount which a farmer could theoretically use to maximise his or her profits, given the land, labour, technology and other capital resources at their disposal. This concept is based on the assumption that farmers can and do allocate their

resources so as to maximise profits. Although this is an abstraction from reality, the concept of "latent" demand is useful for planning credit programmes, and is the basis of many studies of farm credit based on mathematical programming techniques (see section 2.6.3). "Expressed" demand for credit is the amount that a farmer says he or she would borrow if he or she had the opportunity; this may be more or less than the economically optimum, for example among farmers who use loans to substitute for their own savings, which may in turn be used to finance consumption or for some other purpose.

Rural credit institutions generally respond to the "effective" economic demand for credit. This has been shown to vary both spatially and by farmers' economic status, depending on local farming conditions, the level of technology employed and farmers' "absorptive capacity" for credit. Various studies have attempted to forecast the demand for short-term credit using regression analysis to identify the most important controlling variables. The results of some Indian studies for example show that demand is highest in areas where farmers have adopted modern inputs, and increases with higher levels of technology and farm-size (Sharma and Siva Prasad, 1978; Padkie and Gajarajan, 1978; Agarwal and Kumawat, 1974). In a study of the nature and pattern of demand for rural credit in association with water availability in Ernakulan district Kerala, George (1977) found quite predictably, that demand was highest in the irrigated areas where farmers could make the most profitable use of modern inputs.

From the point of view of a national lending institution, estimating and forecasting the demand for farm credit nation-wide is a difficult exercise incorporating a large number of assumptions about the uses of credit within the farm-household economy and the pace of the modernisation process. Regardless of the sophistication of the method used, the resulting estimates are necessarily crude. For short-term lending, estimates may be based on the costs of production and the area under major crops; or by assuming a fixed rate of increase in the uptake of modern inputs among farmers. Alternatively estimates may be based on the assumption that all farmers will want to use the amount of fertiliser and other inputs recommended by extension agents to maximise their output. Deriving

estimates of the demand for credit is complicated by the fact that not all farmers want to borrow from formal institutions, some do not want to borrow every year, while others do not meet the eligibility criteria even though they might want to borrow and could benefit from doing so. Estimates of the demand for credit should ideally be based on the needs of a clearly defined target group, making some allowance for the savings potential of farmers at different economic levels. In planning of this kind, linear programming is a very powerful tool for estimating the amounts of credit necessary to optimise farmers' incomes given their resources of land, labour and capital. However the data requirements for this type of analysis are difficult to fulfil without detailed farm-level surveys.

While estimates of the demand for short-term credit may be derived from a set of relatively straight-forward and realistic assumptions, doing the same for medium- and long-term developmental loans is a very difficult and highly speculative exercise. The assumptions upon which any estimates of latent demand are based are unlikely to be dependable even when details of long-range public and private sector plans for the development of the agricultural sector are available and credible. Projecting forward the "effective" economic demand for term credit is a more manageable exercise but one which begs the question of the optimum level of term credit necessary to bring about the desired level of development. In practical terms the usefulness of such an exercise is rather limited.

2.6 Farm Level Effects of Credit

Whilst there has been a great expansion in the volume of low-cost rural credit disbursed in developing countries in recent years, there has been little parallel increase in understanding of the role of credit in promoting technical change at the farm level. As shown above, the results of studies in various parts of the world present mixed conclusions concerning the effects of traditional RCPs, and have called into question many of the assumptions upon which they are based. It has been shown for example that loans are not benefiting the specified target groups; that shortage of capital is not the only or the most important reason for the low rate of agricultural innovation in less-developed countries; and even where it is associated with the adoption of technical innovations, due to the

fungibility of loans (see section 7.3.1), it is not always possible to accurately quantify the relationship between inputs of credit and farm productivity. The following sections review studies into the effects of loans at the farm level using various methodological approaches. The methodological characteristics of each of these approaches are discussed in section 7.3.2.

2.6.1 Descriptive studies

Studies comparing "borrowers" and "non-borrowers" usually show that borrowers have larger farms than non-borrowers and, as a result of having access to loans, use a higher level of productive inputs. Due to environmental hazards such as drought, flood, pests and diseases however, this is not always reflected in higher levels of production among borrowers. In the final analysis, income per unit area may be equal to or only slightly different from that of non-borrowers. The attribution problem (see section 7.3.1) then makes it very difficult to determine a) the proportion of any difference in output between borrowers and non-borrowers that may be due to institutional loans; or b) the extent to which loans may have been diverted or simply substituted for farmers' own savings to purchase inputs (de Araujo, 1967; Singh, 1974; Colyer and Jimenez, 1974; Cordova et al., 1978; Nyanin, 1978).

Similarly, studies which compare borrowers' economic status "before" and some years "after" the commencement of a credit programme usually show increases in input use, production and income levels and in the acquisition of assets such as tractors, water-pumps and land over the period of registration. A study carried out by the Bank for Agriculture and Agricultural Cooperatives (BAAC), Thailand in 1979 showed improvements on all of these measures for clients in every region since registering with the Bank (BAAC, 1979). Comparing rates of change for BAAC clients with those for all farmers in the country as a whole however, shows that the only difference in the rate of change between BAAC farmers and the rest was in the speed with which they acquired land. There was no difference in the crucial yield variable between the two groups (Lightfoot and Fox, 1983). There is also the problem that measurement of economic status "before" the project is usually based on farmers' recall, which may be questionable over a long time

period[1]. One further limitation of this method is that environmental conditions in the year in which the "after" survey is conducted may result in production and income levels being lower than "before" taking a loan. Generally with such studies, positive increases in particular variables are attributed to the credit programme, while decreases are attributed to other uncontrollable factors (David and Meyer, 1979) (see Chapter VII).

The World Bank's (1976) evaluation of projects providing medium- and long-term credit to crop farmers in the Philippines, Pakistan and Morocco (see Table 7.1), attempted to tackle the "substitution" problem by asking farmers what investments they would have made **without** access to credit. The results show that the amount of variation "explained" by the loans dropped from 67 per cent to 28 per cent of the net production increase when the substitution factor was taken into account. However since it was based on farmers' recall and their hypothetical statements regarding possible investments without credit, the precision of this technique is also limited. The fact that the study takes the "substitution factor" into account at all represents an improvement over other types of descriptive study.

Daines (1975) in his Guatemalan research used what has been termed a "sampling and decomposition" technique to measure the effects of loans among borrowers and non-borrowers, while controlling for farm-size and other environmental factors. The study demonstrated statistically that the effect of institutional loans on farmers' production levels was indirect; borrowers used credit mainly to expand their cropping area either by renting or purchasing, which in turn led to increases in production. In other words, extensification, rather than the intensification of production through greater use of modern inputs was the main reason for increases in output. This technique represents a reasonable approach to dealing with the attribution problem, though the assumption of independence among the explanatory variables, namely factor prices, crop mix and farm-size, may be unrealistic.

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1. This however was not the case in the BAAC study (1979) which used data from the clients' original application forms held at the branch offices.

A further drawback is that most descriptive approaches to assessing the farm-level impact of loans do not take into account interest charges and the opportunity costs of diverting land, labour and capital resources from one type of farming activity to another. Another method for measuring the farm-level effects of loans which over-rides the fungibility and attribution problems is that of discounted cash-flow analysis (Gittinger, 1982). From a farmer's point of view the most important consideration is the extent to which he or she is likely to benefit financially from a particular investment. With this method it is possible to estimate the incremental returns to an investment once repayment obligations have been met. While the method incorporates a number of assumptions concerning yields, prices, marketing opportunities and institutional support, it can give farmers a good indication of the amount of additional income they can expect to earn as a consequence of taking a loan. This approach is most widely used with respect to long-term loans disbursed within the project framework and is particularly useful for evaluation purposes (Fox, 1989).

2.6.2 Econometric Studies

The results of the more statistically sophisticated studies using various econometric techniques also lead to mixed conclusions concerning the farm-level effects of loans. Colyer and Jimenez (1974) found no evidence that year-to-year variation in the value of gross crop income between borrowers and non-borrowers was due to loans. The strength of the statistical relationships between credit receipts and annual expenditure on farm inputs did, however, lead the authors to conclude tentatively that the availability of credit encouraged borrowers to spend more on productive inputs each year.

Chung and Tamin's study in Malaysia (1971), on the other hand, concludes that capital availability is not a critical factor in maximising output for any scale of rice farming operation. All of the farmer respondents were found to allocate their resources efficiently regardless of whether they had access to loans. David et al. (1979) similarly conclude that credit was relatively unimportant in explaining variations in fertiliser use in the Philippines from 1971 to 1977. Mandac and Herdt's 1978 study in the same country, by contrast concludes that measures of financial constraint were the most significant variables in

explaining differences in resource allocative efficiency between borrowers and non-borrowers. Similarly in Surat district, India, Schulter (1974) found that farmers with access to institutional loans were more inclined to take the risk of adopting new technology than those who did not.

2.6.3 Normative studies

Normative studies based on the linear programming technique show that in theory rural credit programmes do have considerable potential as a catalyst to improve farm incomes and to accelerate the adoption of new technology. From a study of borrowers and non-borrowers in Nakon Ratchasima province, Northeast Thailand, Webster (1985) found that small farmers not participating in the institutional credit programme were disadvantaged in three ways:

a) They lost out on annual income because of a shortage of funds and the high price of the funds available from informal sources;

b) in facing a credit constraint the non-borrower is limited to a lower rate of growth in farm income compared to a similar farm with access to credit and

c) due to the trade-off between credit and land, the farmer is constrained by land availability in a way which he would not be were he able to borrow to intensify agricultural production.

The study by Agarwal and Kumawat (1974) in Jaipur district, Rajastan, shows that even with traditional technology, loans can help to increase incomes on all sizes of farm. The authors found that changing to HYV-fertiliser technology without additional capital from loans had an adverse effect on net incomes due to the higher costs involved. Under conditions of unbounded capital, however, the study demonstrated that modern technology had the potential to increase net incomes by an average of 73 per cent. Interestingly, the predicted increase was highest for small-scale farmers at 132 per cent. Mehotra (1978) carried out a similar exercise for data collected in Rajastan. The author found that the potential for credit absorption to raise output was high, particularly among farmers with access to irrigation facilities.

Tewari and Sharma (1978) used a linear programming model to study the likely impact of credit and crop insurance upon the adoption of new technology, again in India.

Farmers with access to dependable sources of credit were found more likely to allocate their resources efficiently and to achieve higher incomes through the adoption of new technology than farmers without access. Crop insurance had a similar impact due to its "risk shifting" effect, which may therefore encourage marginal farmers in particular to invest more of their liquidity reserves in their farms. Baker and Bhargava (1974) however, point out from studies in Badaun in Uttar Pradesh, India, that if credit programmes are to have the desired effect regarding the adoption of new technology, farmers' total household liquidity requirements should be taken into account, not only those pertaining to the farm. Scobie and Franklin (1977) echo this point and emphasise that credit programmes must have an extension element if funds are to be utilised effectively in raising farm productivity and incomes (see section 2.3 above).

Aside from encouraging the adoption of new technology, Naseem (1975) has demonstrated the potential of credit programmes to justify a more equitable pattern of land distribution in less-developed countries, an important pre-requisite for a successful "uni-modal" development strategy as proposed by Johnston and Kilby (1975). Using a linear programming model with data from a sample of farms in Sahiwal district, Pakistan, Naseem (1975) found the minimum viable farm-size to be between five and seven acres provided enough capital was available to enable farmers to increase the area under modern technology, and to grow higher value crops.

Overall, the results of normative studies of this kind indicate that the adoption of new technology and improvements in farm income are constrained by formal loan supplies, particularly for small-scale farmers. Having greater access to low-cost loans reduces the liquidity constraints that prevent some farmers from taking advantage of the potential income-enhancing effects of modern technology, and others from making optimal use of their land resources. However a weakness of programming models is that they do not always capture the full complexity of farm-household behaviour, or of factors external to the household such as pricing and marketing problems which influence the outcome. As explained above the models incorporate a number of assumptions, for example about

households' savings behaviour which may or may hold in reality. Though theoretically interesting, generalised models of this kind are of limited assistance to planners where inter-village and intra-household variations are marked.

2.7 Conclusion

That there has been a dramatic increase in the availability of formal farm credit in many developing countries can be seen as a desirable change in that it represents greater support for the rural sector. However, many rural credit institutions have no clear idea of the real demand for credit among different farm types and operate on the assumption that there is still a large and unmet demand for farm credit without any detailed understanding of the developmental impact of their lending programmes. Farm credit programmes face a number of fundamental problems, both conceptually and in terms of implementation:

At the conceptual level the objectives of credit programmes are rarely spelled out clearly in terms of defined target groups, the appraisal techniques to be used and how small rural producers could be most appropriately supported to use loans effectively. Despite the rhetoric, due to rationing, high administrative costs and fear of default, the majority of small farmers remain outside the institutional credit system. In the final analysis, lending institutions are evaluated mainly in terms of the repayment rates on which financial viability depends. Thus if RCPs are to be a critical component of "uni-modal" development strategy concerned with the distributional effects of government policy and incorporating the small farm sector, lending institutions should also be evaluated in terms of the degree of access given to different economic groups (Adams, 1988) and by the farm-level effectiveness of the lending instruments used to channel funds to them.

Regarding effectiveness, the literature clearly shows that the benefits of access to farm credit for individual farmers cannot be taken for granted. A finding which recurs often is that a credit programme in isolation is unlikely to have much impact on the adoption of innovations or farm productivity. Integration of credit and related support services, either inside or outside the project framework, is likely to be crucially important if the huge volume of funds poured into the agricultural sector each year is to have the desired effect in terms

of increasing agricultural productivity and in helping to reduce inequalities in an effective manner. These issues are explored in the following chapters.

CHAPTER III

THE AGRICULTURAL SECTOR

To establish a framework for the discussion of the rural credit programme in Thailand, this chapter describes the characteristics of the agricultural sector, its progress and problems and the results of selected policy measures taken by the government since the mid-1970s as part of an overall strategy aimed at accelerating agricultural intensification and reducing poverty and inequality in the rural areas.

3.1 The Thai Economy: An Overview

The Thai economy grew at an impressive rate from 1960-80, with annual growth in Gross Domestic Product (GDP) averaging 8 per cent in the 1960s and 7 per cent in the 1970s. Average growth in per capita income of 5.5 per cent during this period was among the highest sustained rates in developing countries (World Bank, 1983). Following a period of policy adjustment and unsteady economic performance during the first half of the 1980s, when the economy was affected by global recession and a down-turn in commodity prices, the economy went on to expand continually during the period 1986-90 (Table 3.1). This was facilitated largely by appropriate macro-economic planning involving aggressive export promotion, relative price stability and increasing foreign and local investment (Robinson et al., 1991).

Table 3.1: Thailand's Average Real Economic Growth Rates 1961-1990

Year	% Growth
1961-65	7.0
1966-70	9.4
1971-75	5.6
1976-80	7.9
1981-85	5.6
1985	3.5
1986	4.9
1987	9.5
1988	13.2
1989	12.0
1990	10.0 a/

a/ Preliminary
Sources: 1971-85 National Income of Thailand, NESDB, Bangkok, various issues; 1985-90, in Robinson et al. (1991), International Monetary Fund.

The process of structural adjustment within the economy accelerated during the 1970s and 1980s. The manufacturing sector, which contributed 16 per cent of GDP in 1970, increased its share to 24 per cent by 1989, while the contribution of the agricultural sector declined from 27 per cent to 15 per cent over the same period (Table 3.2). The service sector retained the largest share of the economy however, its contribution to GDP having increased from 57 per cent in 1970 to 61 per cent in 1989.

Table 3.2: Sectoral Shares of GDP and Annual Growth Rates, 1970-89 (%)

Year	Agric-ulture	Growth rate p.a	Manuf-actur-ing	Growth rate p.a	Services	Growth rate p.a	Total
1970	27.0		16.0		57.0		100.0
		3.8		10.3		5.6	
1975	24.8		20.0		55.2		100.0
		4.0		9.8		8.2	
1980	20.6		21.7		57.7		100.0
		4.9		4.6		6.3	
1985	19.9		20.7		59.4		100.0
		2.2a/		11.9a/		8.4a/	
1989b/	15.0		24.0		61.0		100.0

a/ Average growth rate 1986-88
b/ Estimated
Source: National Income of Thailand, NESDB, various issues cited in Jitsuchon (1990).

3.2 The Agricultural Sector

Despite the decline in its relative contribution to national income over the last two decades, the agricultural sector remains of fundamental importance to the Thai economy. Of the employed labour force of 29.2 million in 1989, agriculture provided full or part-time employment for 60 per cent (Robinson et al., 1991), down from 73 per cent in 1975 (Jitsuchon, 1990). The manufacturing sector by comparison provided employment for 10.4 per cent of the labour force in 1989 (Robinson et al.,1991). Following impressive performance in aggregate terms from 1960 to 1980, annual growth in production from 1980-1985 averaged only 3.3 per cent, declined further to 1.3 per cent in 1986 and to 0.4 per cent

in 1987 (Bangkok Bank, 1987). In the first half of the 1980s the decline was more marked for the crop sector than for forestry or fishery, falling from 4.6 per cent in 1984 to an expected 1.3 per cent in 1986 (BoT, 1986). However, abundant rainfall and improved crop prices, as a result of contracting world production of upland crops, led to a much improved growth rate of 8.5 per cent in 1988 with 4 per cent expected in 1989 (Bangkok Bank, 1989).

3.2.1 Growth and expansion

Growth in the agricultural sector during the period 1960-80 occurred largely through lateral expansion of the planted area, at an annual rate of about five per cent during the 1970s (World Bank, 1978) and increased cultivation of upland crops[1], particularly cassava, maize and sugarcane in response to world market demand for these products (Silcock, 1970; Ingram, 1971; World Bank, 1978). Statistics for the last two decades given in Table 3.3 show the area planted to rice, maize, sugarcane and cassava from 1970/71 to 1988/89. The figures show a 36 per cent increase in the area planted to rice, but a 632 per cent increase in the cassava area, a doubling of the maize area, and almost a quadrupling of the area under sugarcane.

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1. It has been estimated that an additional nine million rai was brought into cultivation during 1950-67 of which appoximately half was devoted to upland crops (Marzouk, 1972; Silcock, 1967; Phongpaichat, 1976).

Table 3.3: Area Planted to Rice, Maize, Sugarcane and Cassava, 1970/71 - 1988/89 (000 rai)

Year	Rice	Maize	Sugarcane	Cassava
1970/71	47,460	5,180	862	1,384
1971/72	47,043	6,368	991	2,039
1972/73	45,931	6,231	1,133	2,725
1973/74	52,270	7,172	1,616	3,000
1974/75	49,889	7,749	1,935	2,969
1975/76	55,602	8,200	2,444	4,327
1976/77	53,595	8,029	3,119	5,293
1977/78	56,444	7,534	3,541	7,282
1978/79	62,485	8,661	3,190	5,286
1979/80	58,971	9,529	2,730	7,250
1980/81	60,110	8,960	2,927	7,940
1981/82	59,970	9,796	3,857	7,726
1982/83	60,134	10,494	3,645	8,552
1983/84	62,596	10,552	3,607	8,780
1984/85	62,329	11,355	3,424	9,230
1985/86	63,422	12,377	3,443	7,748
1986/87	61,571	12,194	3,370	8,820
1987/88	58,888	10,941	3,664	9,879
1988/89	64,677	11,471	4,133	10,136

Source: Agricultural Statistics of Thailand, Crop Years 1982/83 and 1988/89, Office of Agricultural Economics (OAE), Ministry of Agriculture and Cooperatives (MOAC).

Table 3.4 shows production levels for major crops from 1970/1 to 1988/9. Main rice production increased by 22 per cent over the period, compared to 204 per cent for second crop rice, 63 per cent for maize, 47 per cent for cassava, 186 per cent for sugarcane and 61 per cent for rubber. Despite the declining relative importance of main crop rice, it remains of fundamental importance in terms of the volume and value of production and as an export crop (Table 3.5).

Table 3.4: Production Levels for Major Crops 1970/1 to 1988/9 ('000 tons)

Year	Rice value* (000 bt)	Main rice	Second rice	Maize	Cassava	Sugarcane	Rubber
1979/80	42,656	14,646	1,111	2,863	16,540	12,827	534
1980/81	54,970	15,405	1,963	2,998	17,744	19,854	465
1981/82	51,119	15,758	2,017	3,449	17,788	30,200	508
1982/83	49,572	14,774	2,104	3,002	18,989	24,407	576
1983/84	54,444	16,943	2,606	3,552	19,985	23,869	594
1984/85	46,279	17,275	2,630	4,226	19,263	25,055	617
1985/86	46,627	17,930	2,334	4,934	15,255	24,093	773
1986/87	56,491	16,826	2,042	4,309	19,554	24,450	811
1987/88	69,364	15,658	2,771	2,781	22,307	27,191	891
1988/89	85,689	17,882	3,381	4,675	24,264	36,668	862

Source: Agricultural Statistics of Thailand Crop Year 1988/9, OAE, MOAC.
* Includes main and plus second crop rice

Table 3.5: Volume and Value of Major Agricultural Commodity Exports 1983-1989

	Rice		Tapioca		Maize	
Year	Volume (000 tons)	Value (m. bt.)	Volume (000 tons)	Value (m. bt.)	Volume (000 tons)	Value (m. bt.)
1983	3,476	20,157	5,197	15,387	2,657	8,486
1984	4,016	25,932	6,570	16,600	3,145	10,147
1985	4,062	22,524	7,008	14,969	2,782	7,701
1986	4,524	20,315	6,319	19,086	4,013	9,261
1987	4,443	22,703	6,211	20,661	1,649	3,928
1988	5,267	34,636	8,069	21,685	1,151	3,662
1989(e)	6,000	43,000	9,000	23,500	1,600	5,156

Source: Bangkok Bank Monthly Review, December 1989

3.2.2 Agricultural productivity

The rapid growth in the volume of Thailand's farm production and exports has mainly resulted from expansion of the cultivated area rather than through intensification with the use of improved farming technology. The area under farm holdings increased by 90 per cent between 1960 and 1978 from 61 to 116 million rai[1] (Gooneratne, 1982), with substantial reductions in the forest areas in all regions mainly to sustain the growth in area planted to upland crops (World Bank, 1982). In 1979, 320.6 million rai or 33 per cent of the total area was forested; by 1986 the figure had dropped to 91.6 million rai or 28 per cent (Bangkok Bank, 1989). Statistics published by the Office of Agricultural Economics show that the area under farm-holdings increased by a further 27 per cent between 1978 and 1988 (OAE, 1983, 1989).

One of the main problem areas within the agricultural economy, given Thailand's continued dependence on the export of agricultural commodities and as a source of income for farmers, is that there has been no sustained increase in average yields for major crops since the mid-1970s, particularly for main rice and upland crops such as maize, cassava and sugarcane (Table 3.6). Yields have fluctuated from year to year in response to rainfall conditions, the adverse effects of repeated use of the same technology on unsuitable soils, cultivation of marginal lands, soil erosion and low levels of input use particularly chemical fertiliser.

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1. 1 rai = .16 ha.

Table 3.6: Yields of Major Crops
1974/5 - 1988/89 (kgs/rai)

Year	Main rice	Maize	Cassava a/	Sugar cane
1974/5	277	373	n.a	7,702
1975/6	282	380	n.a	8,527
1976/7	283	382	n.a	8,450
1977/8	238	275	2,293	5,415
1978/9	293	340	2,482	6,522
1979/8	281	322	2,235	4,823
1980/1	284	356	2,368	6,958
1981/2	295	377	2,284	7,878
1982/3	284	368	2,618	6,766
1983/4	305	363	2,985	7,126
1984/5	310	389	2,395	7,549
1985/6	312	412	2,239	7,061
1986/7	313	380	2,026	7,521
1887/8	297	328	2,283	7,624
1988/9	316	419	2,437	8,896

Source: Agricultural Statistics of Thailand Crop Years 1982/83 and 1988/89, OAE, MOAC.
a/ data refer to calendar years

Productivity per rai has also been highly variable on a regional basis. Main rice yield increased only in the Northeastern region between 1981/82 and 1984/85, while those of the Northern and Southern regions declined and the Centre showed only a slight improvement. Maize yields also fell in the North and Centre, while cassava and sugarcane yields dropped in almost all producing regions. The overall increase in the yield of second crop rice was largely due to the above average application of chemical fertiliser in irrigated areas (FADINAP, 1984).

Table 3.7: Yields of Major Crops by Region (kgs/rai)

	Northeast	North	Centre	South	Thailand
Main rice					
1981/82	206	423	352	319	295
1982/83	206	367	358	283	284
1983/84	250	391	368	272	305
1984/85	251	398	364	274	310
Second rice					
1982	367	527	582	468	568
1983	378	512	560	412	539
1984	395	594	623	415	591
1985	398	583	624	407	596
Maize					
1981/82	326	393	416	-	377
1982/83	335	357	428	-	368
1983/84	362	360	370	-	363
1984/85	387	383	402	-	389
Cassava					
1982	2,368	2,761	3,084	-	2,618
1983	2,842	2,659	3,276	-	2,985
1984	2,255	2,749	2,578	-	2,395
1985	2,186	2,428	2,298	-	2,239
Sugarcane					
1981/82	7,704	8,277	7,844	-	7,878
1982/83	7,261	6,425	6,715	-	6,766
1983/84	6,780	7,714	7,043	-	7,126
1984/85	7,248	8,323	7,424	-	7,549

Source: Agricultural Statistics of Thailand Crop Year 1988/9, OAE, MOAC.

Despite being among the top rice exporters in the world, Thai rice yields were the second lowest in Asia in 1987 after Nepal (Table 3.8). Maize and sugarcane yields are also very low; only the cassava yield compares reasonably well with other Asian countries.

Table 3.8: Yields for Major Crops for Selected Asian Countries, 1987 (kgs/rai)

	Rice	Maize	Cassava	Sugarcane
Bangladesh	380	-	-	6,687
Burma	473	-	-	-
China	866	603	2,300	8,731
India	320	196	2,779	9,557
Indonesia	627	274	1,745	13,768
Japan	990	-	-	-
Korea DPR	1,134	1,031	-	-
Korea REP	963	-	-	-
Nepal	285	-	-	-
Philippines	423	182	1,393	7,924
Thailand	318	328	2,283	7,624
Vietnam	429	-	944	-
ASIA	530	446	1,897	8,665

Source: Agricultural Statistics of Thailand, Crop Year 1988/89, OAE, MOAC.

3.3 Poverty and Inequality

The second main problem area for Thai agriculture is that of persistent poverty in the rural areas and worsening income distribution. From 1960-80 there was some aggregate progress in poverty alleviation due to rapid aggregate growth in output and income. The proportion of the population below the poverty line[1] fell from close to 60 per cent to 23 per cent during this period (Jitsuchon, 1990). However in the first half of the 1980s, as a result of global recession and declining crop prices, the proportion of families below the poverty line again increased. In 1982, an estimated eleven million people in Thailand and 52 per cent of the population in the Northeastern region, were living in "absolute poverty" (NESDB, 1982). During the economic boom of the second half of the 1980s, however, the situation again improved in aggregate terms and by 1988, the proportion below the poverty line had returned to the 1980 level (Jitsuchon, 1990). The main reasons for the reduction in absolute poverty were a) improved external and domestic prices for major crops since 1987; b) increased production in 1987/88 due to good rains and c) the export boom which has increased the

1. Defined as the annual per capita household income needed to satisfy basic needs. In 1988/89 the figure stood at 4,141 baht in rural areas and 6,324 baht in urban areas (Robinson et al., 1991).

average income level. The overall impression gained from aggregate statistics is that with the exception of the period 1980-85, the proportion of the poor to the total population has decreased since 1975 (Table 3.9).

Table 3.9: Poverty and Income Distribution 1975-88

	1975-76	1980-81	1985-86	1988-89
Poverty incidence[1]/				
Overall	30	23	30	24
- urban	13	8	6	7
- rural	36	27	36	29
Income distribution				
- top 10 per cent	33	35	39	38
- top 20 per cent	49	51	56	55
- bottom 20 per cent	6	5	5	5
Gini coefficient	.43	.45	.50	.48

1/ Measured as the percentage of households below the poverty line.
Source: Hutaserani (1990), cited in Robinson et al., International Monetary Fund, 1991.

Although the incidence of absolute poverty has shown an gradual decline, until the mid-1980s the distribution of income became more disproportionate. The share in total income of the top 20 per cent increased from 49 per cent in 1975 to 56 per cent in 1985, while the gini coefficient rose from .43 to .50. With the economic boom in the late 1980s, there were some signs this trend had slowed, with the share of the top 20 per cent having fallen slightly from 56 to 55 per cent and the gini coefficient dropped back to .48. The share of the bottom 20 per cent however remained static at five per cent throughout the period 1980/81 to 1988/89 (Robinson et al., 1991).

Thus despite the positive trend towards poverty alleviation, income distribution has worsened. In other words, the population is becoming better off in aggregate terms, but at different rates of increase for different groups. The growth pattern has favoured those who are already well-off more than it has the poor. Jitsuchon (1990) explains that the reason for the country's worsening poverty from 1980-85 (Table 3.10) was largely due to the increase in rural poverty caused by worldwide recession and the steady decline in crop prices which

adversely affected rural incomes. Per capita incomes in agriculture have also fallen relative to the non-agricultural sector, with the ratio between the two increasing from 2.08 in 1975/76 to 2.73 in 1986. In other words, mean per capita income of the farm population fell from 48 per cent of the non-farm population in 1975/6 to 44 per cent in 1980/1 and further to 37 per cent by 1986.

Table 3.10: Mean Per Capita Income of Agricultural and Non-Agricultural Households by Year (baht/month)

Year	Agriculture	Non-agriculture	Ratio non-agriculture to agriculture
1975/76	247	513	2.08
1981	503	1,154	2.29
1986	481	1,312	2.73

Source: Socio-economic surveys, National Statistical Office, 1975/76, 1981 and 1986 cited in Jitsuchon (1990).

3.3.1 Orientation of the Fifth Plan

The RTG's first explicit recognition of the problems of poverty and inequality and the need for radically different policies with respect to agriculture, came in the Fifth National Economic and Social Development Plan (1982-86). This was prompted by two main concerns a) the static or declining yields for major crops and b) the persistence of absolute poverty for an estimated 11 million people nation-wide and growing inequality in the distribution of wealth. The Plan defined the "poor" as those with an income of less than 220 baht per person per month; the "better-off" as having 221-330 baht per person per month; and the "wealthy" as those with over 331 baht per person per month. On a regional basis, the distribution of the "absolute poor" defined as the "poor" and "better-off" groups was 52 per cent for the Northeastern regions compared to 11 per cent in the Central region, 23 per cent in the North and 13 per cent in the Southern region.

The Plan recognised that planning to date had resulted in a highly unequal pattern of development and widening inequalities both within and between various income groups and regions. The Central region had been the main beneficiary of development funds

(Panayotou, 1985) with the result that its percentage share of GDP increased steadily from 53 in 1960 to 64 per cent in 1985, while that of the North, Northeast and South declined (NSO, various issues). By concentrating resources and services among particular sub-groups of the population, it was recognised that the government had over time promoted an essentially dualistic or "bi-modal" pattern of development oriented towards the growth of the non-agricultural sectors and the most commercialised farming areas (NESDB, 1982).

By the late 1970s however, inequality and the plight of small-scale and marginal farmers had become issues of major concern to Thai planners and to international agencies seeking to guide development, as increasing social and spatial inequality began "to weigh heavily on the prospects for prosperity in the nation as a whole" (Douglass, 1981 pp.198). There was concern that an increasing number of households would fall into a "subsistence trap" with little prospect of improving their incomes through on-farm activity. Duality was feared likely to increase as the poor could not get beyond subsistence level while the richer farmers benefited disproportionately from available support services and became more commercialised and prosperous.

3.3.2 Fifth Plan proposals

The Plan identified 246 "target" districts and sub-districts in the Northern, Northeastern and Southern regions characterised by high concentrations of poverty and judged to be unable to develop without special assistance[1]. The aim was, through various schemes, to increase agricultural production in these areas by one to three per cent. The "present undesirable concentration of land ownership" was to be reduced, land rents were to be controlled and extra funds made available through the Bank for Agricultural and Agricultural Cooperatives (BAAC) to a) redeem land lost to money-lenders and banks through failure to repay debts; and b) for disbursement within the 246 "target" districts (NESDB, 1982). Credit was an important element of the Plan's overall strategy. BAAC was to increase recruitment by five per cent per year during the Plan period and loan

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1. The Poverty Alleviation Programme takes in 12,555 villages nation-wide.

disbursement by 14 per cent. An additional 200 million baht per year was ear-marked for lending under the Poverty Alleviation Programme in the "target" districts, half of which was to be provided by the government. Direct commercial bank lending to agriculture was also to increase by 10.5 per cent per year, (NESDB, 1982 and BAAC records). Overall, the proposals represented an attempt to move away from the bi-modal development pattern of the past towards a mix of policies aimed at increasing aggregate production while at the same time raising the productivity of the small-farm sector; the type of strategy that would foster

> "rapid economic growth and structural transformation while simultaneously contributing to the social goals of expanding employment opportunities and reducing inequalities in income distribution" (Johnston and Kilby, 1975, p.xix).

3.3.3 The Sixth Plan

The concern with equity issues was carried over into the Sixth National Economic and Social Development Plan (1987-1991) alongside the need to increase aggregate levels of output:

> "The major objective of the Sixth National Plan is to raise the country's level of development for future progress and prosperity while working to solve social and economic problems accumulated from the past" (FAO, 1988, p.244).

The Plan again recognised the need for "spatially-oriented" programmes for both the rural and urban areas and the importance of continuing the poverty programmes started under the previous Plan. Rural villages throughout the country were classified according to their potential for development. Government support services were to be concentrated on the backward villages and those with potential, while the private sector was to be encouraged to invest in the progressive areas. An important theme within the Sixth Plan was the need for integration between government support agencies and between the state and private sectors in order to solve basic production, income and employment problems in rural areas.

The remainder of this chapter considers selected government policies for the agricultural sector, implemented since the mid-1970s, which have attempted to ameliorate the problems of falling yields, rural poverty and increasing inequality. Attention is focussed on the three main areas identified by Johnston and Kilby (1975) as being critical within a

strategy aimed at increasing output without sacrificing national development goals with respect to equity:

- problems and policies relating to land holdings;
- policies related to the development and diffusion of technical innovations;
- policies concerned with the infrastructure and distribution of government resources and supportive services.

3.4 The Land Problem

3.4.1 Land availability

Thailand covers an area of approximately 321 million rai[1](51.4 million ha) of which 46 per cent is under farm holdings. Forty-one per cent of the farmland is located in the Northeastern region, 23 per cent in the North, 23 per cent in the Centre and 13 per cent in the South (OAE, 1988/89). In 1988/89 the total area under farm holdings was about 148 million rai, of which paddy land comprised 74 million rai and (50 per cent) and field crops 36 million rai (24 per cent). In 1988 about 79 per cent of the farmland was owned by cultivators, while the remaining 21 per cent was rented or under some form of leasehold. The average farm holding including land owned and rented was 28.18 rai (OAE, 1989).

3.4.2 Land concentration

Economic conditions and the distributional effects of government policy with respect to land and technical innovations are said to have contributed to the problem of land concentration in Thailand by making it economically advantageous for some farmers to increase the size of their holdings at the expense of small holders. In the mid-1970s, the processes leading to land concentration were said to be major obstacles to an equitable pattern of development. It is however difficult to get a clear picture of the processes taking place. Statistics on land use often conflict and data from different agencies and small-scale studies are frequently contradictory. In the following section, sources which are fairly consistent are used as the basis for a discussion of current trends.

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1. 1 rai= .16 hectares.

During the mid-1970s it was generally assumed that a dramatic increase in land concentration was taking place as small farmers and tenants were thrown off their land in the process of rationalisation of holdings, making increasing numbers of farmers landless (Douglass, 1978; Amyot, 1976). Various pieces of legislation were enacted at this time to demonstrate government concern for the situation (section 3.5). Table 3.11 gives a tentative comparison of the number and percentage of holdings for each farm-size category given by the 1963 and 1978 Agricultural Censuses. Unfortunately the changed farm-size categorisation used for the 1983 Inter-Census of Agriculture prevent direct comparisons from being made, however some impression may be gained by collapsing some of the 1983 categories. Such a comparison shows that the percentage of holdings less than 6 rai in area declined from over 18 per cent in 1963 to around 15 per cent in 1983, while the proportion between 10-40 rai increased from 52 to 58 per cent and there was virtually no movement in the percentage of holdings over 40 rai during the twenty year period. Possible explanations for the observed change may be that a) some farmers with less than 10 rai acquired additional land and moved to a higher category; or b) many have been forced out of farming altogether due to the non-viability of their holdings[1] to become landless labourers. Although paucity of data point only to a tentative conclusion, point b) seems to provide a plausible explanation for the observed differences[2].

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1. Pampiamrat (1980) has estimated that farmers with 10-16 rai will usually have some surplus rice to market; with less than 10 rai, total production may be insufficient to meet subsistence needs and to allow a family to store rice to withstand the economic effects of natural hazards.

2. See also Bangkok Bank (1989).

Table 3.11: Distribution of Farm Holdings by Farm-Size Category, 1963, 1978 and 1983

Farm-size category	1963a/			1978b/			1983c/	
(rai)	No. holdings with land	% of holdings		No. holdings with land	% of holdings		% holdings with land	
< 2 rai	127,264	3.96		64,188	1.59			
2 - 5.99	467,875	14.55	19	574,476	14.29	16		15
6 - 9.99	458,199	14.25	14	484,237	12.05	12		12
10 - 19.99	839,846	26.12		1,065,069	26.50			
20 - 39.99	843,318	26.23	52	1,178,881	29.33	56		58
40 - 59.99	303,546	9.44		398,533	9.91			
60 - 139.99	163,183	5.07		234,992	5.84			
140 and over	11,174	.39	15	18,051	.49	16		15
Total	3,214,405	100.00		4,018,427	100.00			100

Sources: a/ Statistical Yearbook of Thailand, 1965
b/ Agricultural Census, 1978
c/ Inter-Census of Agriculture, 1983.

3.4.3 Tenancy and landlessness

Whether or not land is becoming more concentrated in Thailand, there is little doubt that the problems of tenancy and landlessness have increased markedly since 1963. The greatest increase has been in the Central Plain and appears to be correlated with the high degree of commercialisation in the area (Douglass, 1978). Table 3.12 shows that the proportion of rented land increased from about four per cent in 1963 to 13 per cent in 1988 for the country as a whole and from 11 per cent to 26 per cent in the Central region. According to the 1978 Agricultural Census the percentage of households renting land reached 40 per cent in the Central region[1] in 1978 compared to only nine per cent in the Northeast (NSO, 1978). In the Central region the tenancy figures include a large number of part-owners who rent land in addition to the area owned. However the proportion of "full-

1. Including the Eastern and Western provinces.

tenants" was over 30 per cent in several provinces including Bangkok, Ayuttaya[1], Chatchernsao and Nakon Nyok (NSO, 1978).

Table 3.12: Rented Land as a Percentage of Total Farmland 1963-1988 (%)

Region	a/ 1963	b/ 1975	b/ 1981	c/ 1988
North	2.73	14.23	13.83	17.31
Northeast	.28	2.71	3.48	4.84
Central	11.34	30.86	27.85	26.22
South	.31	3.01	4.31	5.38
Thailand	3.80	12.11	11.61	12.69

Sources: a/ Statistical Yearbook of Thailand, 1965;
b/ Agricultural Statistics of Thailand, Crop Years, 1982/3 and 1988/89.

According to a study by Douglass (1978) in the Bangkok Metropolitan sub-region (10 provinces), full tenancy is found most commonly among farms under 10 rai, the percentage of holdings in this group having increased from 17.3 per cent in 1963 to 30.4 per cent in 1974. In Ayuttaya, Amyot (1976) found full tenants were concentrated in the less than five rai category. The economic status of small-scale tenant farmers is difficult to evaluate in the absence of reliable data showing the full extent of the problem. However a 1979 study by the Agricultural Land Reform Office in twelve Central and Northern provinces characterised by high degrees of tenancy and landlessness concluded that about 50 per cent of the sampled households were below the poverty line delineated at 10,000 baht per year and were unable to meet their basic needs.

Aside from the question of the economic viability of small holdings a number of other reasons can be given for the increase in tenancy and landlessness. With improvements in land quality in the Central region through irrigation and on-farm developments, land values have increased substantially. There has been much speculative purchase of large areas and an increase in absentee landlordism. Pakkasem (1978) estimates that about 25 per cent of

1. Amyot (1976) found that over 75 percent of households in his study villages in Ayuttaya province rented all or part of their holdings.

owners in the Central Region are absentee[1]. How commonly tenants are dispossessed if and when landlords wish to amalgamate their holdings is not known but remains a likely consequence of land consolidation schemes in this area (see section 3.5.3). Infrastructural projects roads, canals and urban growth area have also taken up increasing numbers of farmholdings particularly around the Bangkok Metropolitan Area.

Indebtedness is also frequently cited as an important reason for loss of land where farmers have mortgaged their property on formal and informal loans and have been unable to pay their debtors. Accurate figures reflecting the full magnitude of the problem are scarce. From a systematic check through Land Department files in 1978, staff from the BAAC found that at the time of the survey, an area of land valued at 2,800 million baht had changed hands as a result of foreclosures on mortgages or from land sales with right of redemption. Fragmentation of holdings into non-viable plots through inheritance is a further reason often assumed to contribute to the rise of tenancy and landlessness in the Central region. Although few reliable data are available for the region, Amyot (1976) concludes from his small study in Ayuttaya that land inheritance and debt defaults were relatively unimportant reasons for decreases in the size of land holdings over time[2]. Sales transactions were by far the most common cause.

3.5 Government Policies with Respect to Land

There are basically three problems with respect to land in Thailand; a) increasing tenancy and landlessness; b) insecure tenure; and c) the need to increase land productivity. Since the mid-1970s, the RTG has enacted various pieces of legislation to positively affect each of these areas.

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1. The author estimates that through turning land over to tenant farmers, absentee landlords take a minimum of 40 per cent of the value of tenant production out of the locality each year (Pakkasem, 1978).

2. Among the small number of farmers who lost land in Amyot's (1976) study, in no instance was it due to loan default.

3.5.1 Land reform

The question of land reform was given serious consideration for the first time in the mid-1970s. The enabling act establishing the Agricultural Land Reform Office (ALRO) was narrowly passed in 1975. The objectives of the programme were to a) enable landless farmers to have their own land for cultivation; b) to increase agricultural production; and c) to reduce the income gap between urban and rural areas. Due to political and financial obstacles however, the provisions of the Act did not come into effect until 1977 (Turton, 1978; Suehiro, 1981)[1]. The original intention of the programme was to reallocate crown, public and private land to landless farmers and to those already in de facto possession of the land (squatters). However because of the difficulties involved in purchasing and redistributing private land, ALRO's emphasis was later shifted to the estimated 3.12 million rai of encroached public forest land, with a view to establishing new settlements under the authority of several agencies, including the Public Welfare Department (PWD), the Land Development Department (LDD), the Cooperative Promotion Department (CPD), the Royal Forestry Department (RFD) and ALRO (Panayotou, 1985). Poor coordination and shortage of funds however limited ALRO's achievements to only a fraction of the target. By 1980 only 622,160 rai, 13 per cent of the targeted area during the period 1977-80 had been reformed (Panayotou, 1985). No recent data are available to show the regional distribution of land reform areas, but many of the existing projects were developed as a means to intensify the use of land in the Central region.

3.5.2 Land titling

A set of studies carried out by Kasetsart University on behalf of the World Bank in 1986 indicated that in 1980, 56 per cent of the total agricultural land in Thailand was under title (Chanot, Nor Sor 3, Nor Sor 3 Kor); the remainder, about 58 million rai was not. Only

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1. A maximum holding of 50 rai was to be permitted for cropland, 20 rai for unutilised land and 100 rai for pastureland. However the Act permitted a number of exceptions: For example, estates of up to 1,000 rai could be retained provided all the land was cultivated by the owner. Even estates of over 10,000 rai could be kept on as long as the land was productive and farmed efficiently with modern technology (Turton, 1978).

two per cent of farmland in the Northeast was under the full title document (Chanot) compared to 37 per cent in the Central Plain. It was estimated that 33 million rai (21 per cent) of the land under private occupation officially classified as reserve forest, was cultivated by squatters, many of whom had had de facto possession of the land for 10-20 years but could not obtain titles or certificates of utilisation (Onchan and Feder, 1985; Feder, 1985; Chalamwong and Feder, 1985). The studies argue that giving farmers security of tenure and land titles acceptable as collateral on fairly priced institutional loans would increase the productivity of the land by a) allowing greater investment in modern inputs and increased agricultural output; b) reducing the likelihood of land disputes and c) promoting improved soil management and land use practices. The studies therefore recommended a massive government effort to provide title to all farmers cultivating land as the pre-requisite for efforts to improve productivity. Although some progress has been made, the government has yet to make a firm commitment to issuing land titles to all farmers throughout the country and it remains a block on access to institutional loans for developmental purposes[1].

3.5.3 Land consolidation

One of the government's main policies to promote the intensification of the production process has been through support for on-farm development to further increase the productivity of irrigated areas, principally in the Central region. Large scale dry season

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1. To help solve the squatter problem the government recently initiated a land reclassification programme, whereby squatters on forest land may be issued with Sor Tor Kor (STK) titles for a limited area of 15 rai. The immediate objective of this endeavour is to provide security for short-term institutional loans and eventually, full security of tenure. However it has been very difficult for the PWD and other government agencies involved in resttlement including the CPD and ALRO to enforce the 15 rai limit on farm-size. Many farmers have been cultivating areas much larger than this for twenty years or more and are not prepared to file for certification and pay annual rent for land which they already see as their own. Members of the same family may apply for additional plots of 15 rai, but they must be seen to be living in established and independent households. So far the BAAC, within the framework of the EC Rubber Planting Project in the Eastern provinces of Rayong and Chantaburi is the only financial institution willing to give long term loans against STK certificates. Following a number of flooding disasters attributed to destruction of watershed areas and logging scandals, the government officially closed the forest in 1989. All application for STK certificates were put on hold pending further discussion.

irrigation became possible after completion of the Bhumipol dam in 1964 and the Sirikit dam in 1972. However the potential for year-round irrigation and the optimisation of yields had not been achieved. Additional investment was required to upgrade the system and allow further extension of the double cropped area. The Land Consolidation Act was passed in 1974 and a pilot scheme started in Chanasutr, Bang Rajan district, Singburi covering 1,800 hectares. The success of this scheme led to the establishment of a 10-year land consolidation project for the Northern Chao Praya Basin largely financed by international agencies. By 1988, a total of 580,592 rai throughout the country had come under intensive and 1,110,387 under extensive land consolidation. Of the area under intensive and extensive consolidation 83 and 41 per cent respectively was in the Central region (OAE, 1988/89).

In aiming to increase productivity and the optimal use of land in irrigated areas, the objectives of the land consolidation programme have been quite different to those of ALRO which has aimed to provide land for the landless. Technical improvements including land levelling, boundary realignment, the construction of tertiary canals were believed to have the potential to optimise yields for all farmers, but especially for small-scale operators in irrigated areas (Douglass, 1978). From a study of land consolidation in Chainat province, Pakkasem (1978) estimated that the mean farm-size necessary to generate a reasonable farm income would decrease from 25-30 rai to 5-7 rai with land consolidation due to the availability and efficient use of water and other inputs necessary to change from single to double cropping. Land consolidation was shown to have the potential to increase the carrying capacity of the land by a factor of four and therefore justify a change to a more equitable pattern of land distribution.

Evidence suggests however that this type of development creates strong incentives for farmers to increase rather than decrease the size of their holdings. In the Chainat study area, Pakkasem (1978) found that the percentage of farms under 20 rai dropped from 39 per cent of the total in the early 1970s to 28 per cent by 1976. Moreover, gross farm incomes of farmers inside the project area increased to five times that of farmers with the same amount of land outside and rentals charged on land close to the project area, increased from 120

baht before the project to 200 baht after.

Thus land consolidation projects, which have mainly benefited the Central region, have brought considerable economic advantage to particular farmers on the one hand, while tending to create inequalities between participant and non-participant farmers on the other. Conflicts also developed between farmers who joined free government projects and those who had to take loans for on-farm development as well as between farmers with different scales of farming operation. Lack of co-ordination between participating line-agencies, poor engineering work and unfavourable weather conditions resulted in post-project yields in some cases being lower than pre-project[1]. This left many farmers worse-off than before and saddled with heavy debts which they were unable to repay from income generated on the farm. Overall, the potential of land consolidation for intensifying agricultural production and facilitating a more equitable pattern of agricultural development in Thailand has not been fully realised.

Apart from reforms with respect to land, various policies implemented by the RTG from the mid-1970s onwards aimed to increase agricultural productivity through the use of improved inputs and the provision of more equitable access to government supportive services, such as irrigation, extension, credit, input supply and marketing facilities and to increase rural incomes through opportunities for dry-season employment. The nature and effects of policy initiatives in each of these areas are discussed below.

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1. As happened in the land consolidation projects in Tambon Sing and Sub-District Phranonchaksri in Singburi province and in Tambon Sawaengha, Angthong province, under Phase II of the Upper Chao Praya Irrigation Project funded by the World Bank, through BAAC (Project Completion Report, BAAC, 1985).

3.6 Government Policy with Respect to the Diffusion of Innovations

3.6.1 High-yielding varieties

High yielding varieties (HYVs) of rice were first introduced to Thailand in 1956[1] and have had a marked impact on production levels, particularly in the Central Plain. In the early years of crop breeding and experimentation, their acceptability was generally limited due to the poor taste, susceptibility to disease, and the high cost of chemical fertiliser which is necessary to achieve yield potential (Marzouk, 1972). Following the establishment of the International Rice Research Institute (IRRI) in Los Banos, Philippines, the Rockefeller Foundation seconded a rice breeder to Thailand in 1966 who introduced over a large collection of IRRI's rice genetic materials. The first non-photosensitive variety with a shorter growing season, RD1, was introduced to Thailand in 1969, and since then at least fifteen HY non-photosensitive varieties have been released which have gone on to dominate irrigated rice namely, RD 1 to 9, 11, 13, 15, 17, 19 and 23 (Isarangkura, 1986).

In addition to the Seed Exchange Programme introduced in the mid-1970s to increase the supply and availability of HYVs, the Fifth Plan allowed for the construction of thirteen additional seed centres with Japanese and American assistance. The government's role in improved seed breeding and multiplication has expanded rapidly since 1975. The DoAE currently concentrates on seven types of seed namely rice, maize, sorghum, mungbean, groundnut, soybean and cotton, which are produced either directly by DoAE[2], or by contract farmers with credit provided by BAAC (Bangkok Bank, 1986). These and other

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1. The rice improvement programme was initiated around 1910 with the first rice experimental station being set up in 1916 in Rangsit. Thailand joined the Food and Agriculture Organisation (FAO) of the United Nations after the second world war and later benefitted from US technical assisance and from the Indica-Japonica hybridisation programme (Sarangkura, 1986).

2. Over 2 billion US dollars was invested in construction of 20 seed multiplication centres managed by the DoAE. According to the World Bank, this may be one of the largest government seed networks in the world (World Bank, 1987).

types of seed are also available to farmers through the private sector[1].

Until recently, most of the basic and applied research in seed technology had been directed mainly towards developing improved rice breeds and more intensive cropping systems for the irrigated areas, the yield of which is in large part determined by the degree of water control (Sriswasdilek et al., 1975) While some research on rainfed systems has been carried out and improved "native" varieties have been produced, there is still a need to develop varieties and cropping systems suitable for rainfed conditions that would contribute to higher yields and a reduction in regional disparities (Panayotou, 1985). While the majority of Northeastern farmers have abandoned native varieties in favour of "improved" local varieties, there is no firm evidence that existing HYVs developed for rainfed areas out-perform local varieties under typical farm management conditions. Hence distributing seeds to farmers without adequate extension advice may not yield the expected results in terms of increased productivity (Isarangkura, 1986).

3.6.2 Fertiliser

The use of chemical fertiliser in Thailand has grown considerably over the last 20 years, the demand and usage being highest for rice in the irrigated areas, where double cropping is most widespread. The quantity of fertiliser used for all agricultural purposes increased from 786,000 tons in 1979/80 to close to two million tons in 1988/89, an increase of more than 150 per cent (Table 3.13) (FADINAP, 1990).

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1. In order to avoid duplication of effort, the World Bank has recommended that the Department of Agriculture (DoA) and the Department of Agricultural Extension (DoAE) should concentrate on research and production of improved seed, while the private sector takes responsibility for seed multiplication and distribution with adequate government regulation to ensure standards are maintained (World Bank, 1987).

Table 3.13: Fertiliser Use in Agriculture, 1975-88

Year	Total1/ products	Nutrients N	P 0 2 5	K 0 2	Total nutrients
1975	506,428	85,781	65,451	25,983	177,215
1976	664,391	112,537	85,866	34,088	232,491
1977	792,024	134,156	102,361	40,637	277,154
1978	785,433	133,040	101,510	40,298	274,848
1979	827,204	140,115	106,908	42,442	289,465
1980	786,341	133,194	101,627	40,345	275,166
1981 (r)	894,542	151,140	116,265	45,763	313,168
1982	1,042,503	174,766	134,229	57,648	366,643
1983	1,272,041	233,388	154,071	83,701	471,160
1984	1,246,688	229,551	142,623	67,916	440,090
1985	1,250,000	252,900	124,999	55,663	433,562
1986	1,400,000	319,927	137,409	72,930	530,266
1987	1,548,765	342,784	148,344	96,245	587,373
1988	1,992,633	439,720	200,833	137,456	778,009

1/ Calculated as imports plus last year's carry over plus local manufacture - next year's carry over.
(r) - revised
Source: Agricultural Statistics of Thailand, Crop Year, 1988/9, Office of Agricultural Economics, MOAC.

Of the 1,992,633 tons of fertiliser distributed in Thailand in 1988/89, 65 per cent reached the farmer through the private sector and 35 per cent through government or cooperative agencies including the Marketing Organisation for Farmers (MOF), the Agricultural Cooperatives Federation of Thailand (ACFT), BAAC and the Office of the Rubber Replanting Aid Fund (ORRAF). In the same year nearly 43 per cent of all fertiliser used in Thailand was for paddy, the amount used having almost quadrupled from 242,772 tons in 1975 to 852,000 in 1988/89. Upland crops absorbed 19 per cent of the total in 1988/89 and orchards 24 per cent, the proportion having increased from 13 per cent in 1983/4 (FADINAP, 1990).

The bulk of the available fertiliser is directed towards the Central region which consumed 43 per cent of the total in 1988/89 (Table 3.14), followed by the Northeast (20 per cent). In the Central and Northeastern regions paddy is the main crop for which fertiliser is used. In the North, upland crops account for the largest share of fertiliser consumption and in the South fruit trees (FADINAP,1990).

Table 3.14: Fertiliser Use by Region, 1983/4 and 1988/9 (in product tons)

Region	1983/4	per cent	1988/9	per cent
North	226,254	17.8	365,310	18.3
Northeast	273,156	21.5	394,570	19.8
Central	591,856	46.5	863,120	43.3
South	180,775	14.2	369,000	18.6
Total	1,272,041	100.0	1,992,000	100.0

Source: Office of Agricultural Economics, Important Data on Fertiliser (revised edition), MOAC, 1989 quoted in FADINAP Draft Report, 1990.

Although fertiliser use expanded at an annual rate of about 14.4 per cent during the period 1960-1986 (FADINAP, 1990), in absolute terms, fertiliser application rates in Thailand are still among the lowest in Asia (Table 3.15), with 39 kgs/ha., ranked eleventh among the countries listed. On average farmers apply only 24 kgs./ha. on paddy compared to 330 kgs./ha. on vegetables, 51 kgs./ha. for orchards and 89 kgs./ha for field crops.

According to the FADINAP estimates published in 1990, fertiliser use in Thailand was only 16 per cent of the theoretical optimum level of fertiliser demand based on average fertiliser recommendations prevailing at the time.

Table 3.15: Average Fertiliser Use Per Hectare, Paddy Yields and Nitrogen to Paddy Price Ratios for Selected Asian Countries

Country	Nutrients used 1/ (NPK) 1988/89		Paddy yield 1987 1/		N/Paddy price ratio 1979 2/
	kgs/ha	Rank	kgs/ha.	Rank	
Rep. of Korea	399	1	6.019	1	.74
China	238	2	5.528	2	n.a
Malaysia	168	3	2.530	5	2.46
Indonesia	112	4	3.977	3	1.07
Sri Lanka	98	5	3.194	4	1.73
Bangladesh	87	6	2.377	9	1.62
Pakistan	84	7	2.531	8	3.85
Vietnam	82	8	2.184	6	n.a
Philippines	65	9	2.144	7	3.10
India	65	10	2.224	10	3.34
Thailand	39	11	1.961	11	3.89
Nepal	25	12	1.779	12	n.a

Source: 1/ FADINAP database, 1990; 2/ World Bank, Rice Handbook 1981, FAO Production Yearbook 1979; FAO Fertiliser Yearbook 1979, cited in Asian Development Bank: Thailand: Agricultural Sector Assessment, March 1984.

While partly due to the small area under reliable irrigation, Thailand's comparatively low level of fertiliser consumption has been mainly due to government pricing polices which have allowed input costs to remain high compared to the value of incremental production (World Bank, 1987). From 1963 until the freeing of the fertiliser market in 1978, the government had granted promotional privileges and tariff protection to one particular firm[1] which resulted in a virtual monopoly on the supply and pricing of fertiliser and prices up to two-thirds above the free market rate (Krongkaew, 1979). Compound fertilisers were promoted at the expense of more economical single nutrient fertilisers such as urea[2], (World Bank, 1987) and the nitrogen to paddy price ratio was the most unfavourable in Asia in 1979 (Table 3.15). These problems were exacerbated by a) the effects of the oil crisis of 1973 which led to increases in the international price of fertiliser; b) the prevailing low farm-gate prices for paddy caused by the rice premium; and c) poor yield response due inadequate irrigation and extension support.

Prices continued to rise until 1975 when the government became involved in the bulk purchase of rice and sugarcane fertilisers for distribution and sale at subsidised prices through the Marketing Organisation for Farmers (MOF) and the Agricultural Cooperative Federation of Thailand (AFCT) (Panayotou, 1985). As a result of this scheme, the price of 16-0-0 fertiliser dropped from 5,250-5,600 baht per ton to 3,800 baht per ton. This caused serious problems for other dealers in the fertiliser market, who were unable to compete with MOF on the basis of price (World Bank, 1982). The impact of the policy also varied spatially, according to the availability of irrigation, soil type and the credit supplies (Panayotou, 1985). While the availability of fertiliser through public and private channels has greatly increased in

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1. Located in Mae Moh district, Lampang province (Panayotou, 1985).

2. This is said to have been wasteful since soils in Thailand show a poor response to potassium in compound fertilizer. According to the World Bank (1982), if cheaper (unsubsidized) single-nutrient fertilisers were used instead of compounds, the value:cost ratio of using fertiliser could more than double for rice farmers in low risk areas. The same would be true for maize, sorghum, kenaf and cotton.

recent years, the reform of fertiliser pricing policy is still seen as crucial to the intensification of Thai agriculture and to bringing the small farm sector[1] and poorer regions of the country more effectively into commercial production (World Bank, 1987).

3.7 Government Policy with Respect to Infrastructure and the Distribution of Support Services

3.7.1 Irrigation

Controlled water supply is an essential pre-requisite for higher output to be achieved through the application of HYV-fertiliser technology and double cropping. Government awareness of the importance of irrigation first became apparent in the First National Economic and Social Development Plan (1961-66). At this time the emphasis was on investment of large-scale irrigation projects, predominantly in the Central region. Other major irrigation developments included the construction of six large dams in the Northeast, numerous medium-scale projects in the South and the development of the Pattani and Mae Klong River Basins by the Royal Irrigation Department (RID).

Between 1961 and 1976 the area under irrigation increased at a rate of seven per cent per year nationally, while expansion in the Central region proceeded at six per cent per year over the same period, covering 68 per cent of the rice area by 1976. Starting from a much lower base, irrigation expansion in the Northern and Southern regions increased by over 20 per cent encompassing 19 and 25 per cent of the total rice area by 1976. The rate of annual expansion in the Northeast however was only three per cent over the same period and the irrigated land, as a percentage of total cultivated land decreased from 5.3 per cent in 1961 to 5.1 per cent in 1976 (Panayotou, 1985).

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1. If farmers are to make more effective use of fertiliser, there is a need for improvements in DoAE's recommendations on the type and quantity of fertiliser to use on different crops and soil types. Current recommendations are often based on old field experiments when single-nutrient fertilisers were not easily available, and given in terms of amounts necessary to optimise yields, rather than the amounts which are most cost effective. A priority should be to familiarise farmers with the use of cheap sources of nitrogen and phosphates and evaluate the response and benefits under typical farm conditions (World Bank, 1982; AsDB, 1984).

It was not until the early 1970s that the potential of dry season double cropping to increase aggregate output became apparent. The emphasis from the Third Plan (1972-76) onwards was to achieve this through small- and medium-scale irrigation projects including ditches and dikes, tanks, land levelling and consolidation distributed so as to help spread the benefits of irrigation over a wider area (Mongkolsmai, 1983). In the Northeast and North, the schemes included small reservoirs (tanks) and pumping irrigation controlled by the National Energy Authority (NEA). The aim of the irrigation policy was to increase the efficiency of the distribution system from the existing dams, pumping stations and reservoirs, while developing small-scale projects to meet the basic water requirements of every village (AIT, 1978). Table 3.16 shows that by 1983 about 29 per cent of holdings nation-wide reported having some irrigated land, ranging from 14 per cent in the Northeast to 49 per cent in the Central Plain. In terms of area, 39 per cent of the agricultural land in the Central region was irrigated, compared to 6 per cent in the Northeast and 17 per cent for the country as a whole, a total of 17 million rai (Table 3.17) (NSO, 1983).

Table 3.16: Number of Holdings* Reporting Irrigated Land, by Farm-size Category and by Region, 1983

Region	Total no.of farms (1)	<6 rai	6-9.9	10-39.9	40+	Total no. irrig. (2)	(2) as % of (1)
North	1,129,942	141,436	105,497	226,902	46,408	520,243	46
Northeast	1,898,704	20,197	27,842	165,456	51,544	265,039	14
Central	815,175	58,934	38,676	222,350	78,392	398,352	49
South	620,068	9,884	12,748	58,711	8,991	90,334	15
Total	4,463,889	230,451	173,263	673,419	185,335	1,273,968	29

* With land

Source: Inter-Censal Survey of Agriculture, NSO, 1983

Table 3.17: Area Irrigated by Size of Holding and by Region, 1983

	Total area of farms (1)	<6 rai	6-9.9	10-39.9	40+	Total area irrig. (2)	(2) as % of (1)
North	21,625,953	426,716	573,377	2,734,776	1,476,993	5,211,862	24
Northeast	44,820,218	64,476	139,107	1,545,317	860,037	2,608,937	6
Centre	21,903,597	220,258	283,940	4,217,461	3,809,907	8,531,566	39
South	11,125,105	30,102	58,285	525,969	152,596	766,952	7
Total	99,474,873	741,552	1,054,709	9,023,523	6,299,533	17,119,317	17

Source: Inter-Censal Survey of Agriculture, NSO, 1983.

Despite the inequitable distribution of irrigated land and the oft-stated need for supplementary irrigation support in the Northeast, the small-scale projects in the region have met with only limited success. For example it has been estimated that of the total area fed by pump irrigation from 1974 to 1982, less than 20 per cent was actually utilised in the dry season, with wide fluctuations in utilisation from year to year (Wongsekiarttirat, 1986). Apart from the question of water availability, the reasons for this situation are unclear. Wongsekiarttirat's (1986) study in Roi-et province, concluded that planners' expectations as to the benefits of investment in irrigation through rapid expansion of the double-cropped area did not materialise, largely due to the preferred application of family labour to non-farm income-generating activities during the dry season. The study concludes by questioning the opportunity cost of large-scale investment in irrigation in the Northeastern region, where, under environmental conditions of high risk and uncertainty, alternative sources of income are more reliable.

The current irrigation policy for the Central region is to continue expanding the area under irrigation and land consolidation so as to further the intensification process and increase yields per unit area. For the Northeastern region, despite reservations such as those expressed above, the policy is to continue the "greening of the Northeast" through the construction of new facilities and the rehabilitation of small-scale structures with a view to

increasing utilisation rates during the dry season and discouraging migration to Bangkok. Without significant increases in farm-productivity, the benefits to be derived from such a policy are dubious.

3.7.2 Extension

The Department of Agricultural Extension (DoAE) has a vital role to play in the modernisation and development of Thai agriculture. Before 1977, extension work was carried out on an ad hoc basis and the Department was relatively ineffective due to insufficient and poorly-trained staff, shortage of transport facilities, lack of financial support from government and no appropriate extension method. In the early 1970s, the World Bank made it a condition of a loan to support irrigation, that a more efficient extension system should be developed to provide technical support to farmers in the irrigated areas. The National Agricultural Extension Project (NEAP) was initiated in 1977 with financial and technical support from the World Bank and USAID[1] based on the Training and Visit Scheme (Benor, 1977; 1984). The initial objective of the project was to reduce the working ratio of extension agent to farmers to 1:200 in the irrigated areas and to 1:2,000-3,000 elsewhere. The ratio of extension workers to farm-families in 1977/78 is given in Table 3.18. The first phase was to provide an improved extension service to 2.8 million farm-families located in 33 provinces. The main aims were to increase the effectiveness of field-level officers through in-service training, strengthen links with research to help solve agro-technological issues and streamline the dissemination of technical advice through frequent contact with farmers at the village-level (Pakdee, 1983). The second phase of the project with similar objectives, NEAP II[2], began in 1980 encompassing the remaining 39 provinces within the system.

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1. The total cost of NEAP I was US$ 59 million, of which the World Bank contributed US$28 million in capital and operating costs and USAID US$ 3 million for training. The outstanding amount was covered by the RTG (Pakdee, 1983).

2. NEAP II cost US$70 million of which the World Bank contributed US$40 million with an RTG contribution of US$30 million.

Table 3.18: Ratio of Extension Workers to Agricultural Households by Region, Thailand, 1977/78

Region	Total agric. households	Before 1977		1977		1978	
		No.	ratio	No.	ratio	No.	ratio
North	1,351,271	477	1:2,833	477	1:2,833	477	1:2,833
Northeast	1,907,706	633	1:3,014	1,130	1:1,688	1,130	1:1,688
Central	1,083,405	558	1:1,942	558	1:1,942	922	1:1,175
South	689,846	470	1:1,468	470	1:1,468	912	1:756
Total	5,032,229	2,138	1:2,354	2,635	1:1,910	3,441	1:1,462

Source: DoAE, Ministry of Agriculture and Cooperatives, Bangkok, cited in Panayotou, 1985.

Despite the large-scale investment in facilities and manpower, the extension system still has a number of operational problems which limit the effectiveness of the service. These include the low level and inappropriate training of recruits; shortage of facilities, including housing, audio-visual aids, transport, lack of incentives and insufficient funds to cover teaching materials. The shortage of funds to cover daily allowances for field visits has resulted in commune-level extension agents (kaset tambons) often failing to maintain their visiting schedules and frequently being given assignments to carry out non-extension activities such as supervising the Rural Job Creation Scheme (see section 3.7.3) (Pakdee, 1983). Furthermore, tambon extension agents tend to be inexperienced and under-trained; lack supervision and confidence in dealing with farmers with limited capacity to innovate; and are frequently rotated, all of which serves to constrain the effectiveness of extension officers as change-agents in the rural areas.

Although the system is now well established throughout the country, there is evidence to suggest that there is bias in service provision towards the most progressive agricultural areas, those involved in special projects[1], and the most responsive farmers (often selected as "contact farmers") who tend to be in a better position to adopt technical

1. The sample survey for the IFAD-funded BAAC-DoAE Pilot Project in five Northeastern provinces (BAAC, 1983) showed that the mean number of extension visits by province during the second year of the project, ranged from .94 to 3.61 for participants and from .57 to 2.62 for non-participants BAAC, 1986).

innovations and to provide land for demonstration purposes. Many of the poorer farmers, who do not have the financial resources to experiment with new farming techniques, and are unable to sustain the risk involved with new crops for which the marketing situation is uncertain, often fail to benefit from the system which is ostensibly designed to assist them (Heim et al., 1986).

3.7.3 Rural job creation schemes

The first attempt to provide opportunities for dry-season employment in the rural areas was in 1975 with the introduction of the "Rural Development and Job Creation Project". The objectives of the project were a) to provide opportunities for income generation during the dry season and b) to promote local participation and democracy in rural areas (Jitsuchon, 1990)[1]. In that year 2,500 million baht was allocated in equal sums to 5,023 rural tambons to spend on local infrastructural development projects that would create employment during the dry season. Each tambon, regardless of size, received 480,000 baht in 1975 and 600,000 in 1976 under what had been renamed the "District Development Project" (Jitsuchon, 1990). Village councils decided on the infrastructural needs of the local area, and it then became the responsibility of the tambon councils to recruit labour, purchase materials and execute the work. The jobs created included road construction, water supply provision, installing power lines and bridge building.

The scheme was severely criticised on a number of counts in the first two years. For example only 30-50 per cent of the projects were judged by the recipients to have yielded beneficial results for the community and only 46-57 per cent of the budget went on wages. There were delays in paying workers and the scheme was plagued by misappropriation of funds at various levels (Turton, 1978). Of the 41,267 separate projects carried out, 60 per cent were concerned with road and bridge development and 19 per cent with irrigation schemes which benefited only a minority of farmers (Phiphatseritham, 1975). Locationally

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1. It is noteworthy that this initiative took place at the same time as government intervention in the rural credit market.

advantaged farmers benefited doubly from the improved infrastructure and the chance to earn additional income. The project was abandoned after the second year of operation.

The fund was reintroduced in 1980 as the "Rural Job Creation Scheme" under the responsibility of the Ministry of the Interior. A total of 3.5 billion baht was distributed among the tambon councils which again had the authority to plan and implement local development projects to provide employment in the dry season. The implementation period was extended from the three-months of the rainy season to six months; district councils were to spend 70 per cent of the total budget in paying wages; and projects were to be completed within one fiscal year and were not to duplicate the efforts of other government agencies. Priority was to be given to poorer tambons in rainfed areas, those lacking good quality infrastructure and those with high seasonal unemployment (Jitsuchon, 1990).

While there was still room for misappropriation of funds[1], most evaluations show that in terms of the number of projects planned and implemented and the proportion of total funds spent on wages, the on-going project[2] is relatively successful. Jitsuchon (1990) quotes estimates that about 60 per cent of the income augmented by the scheme in 1982/3 went to people with incomes below the district average. The two outstanding problems are, however, that a) the budget allocation decreased from 3,500 million baht in 1980 to 2,000 in the following years and may decrease further; and b) the unequal distribution of the benefits of the scheme across regions (Table 3.19). Participants in the relatively affluent Central and Southern regions received more in additional income under the scheme than those in the poorer Northeastern and Northern regions where opportunities for dry season employment are much more limited (Jitsuchon, 1990). Given the increasing importance of non- and off-farm income as contributors to total family income in agriculturally marginal areas such as the

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1. The official rate for piece-work in 1980/81 was 25 baht per unit of earth moved. From personal observation in Chainat province during the dry season a rate of 20 baht was paid to farmers.

2. Operated every year from 1982 to 1988 with a budget allocation of 2,000 million baht (Jitsuchon, 1990).

Northeast[1], (Meyer and Alisbuscan, 1984) promoting alternative income-generating activities may be the only realistic strategy for improving rural incomes in poorer areas and preventing income inequalities from widening further (Chinn, 1979; ROFEAP, 1983).

Table 3.19: Average Income Received from Rural Employment Programmes
(baht per head)

Region	Years of evaluation			
	1980	1982/3	1984	1985
North	707	930	n.a.	996
Northeast	775	1,015	1,088	870
Central	1,124	1,075	1,678	2,196
South	1,153	1,182	1,976	1,481
Whole kingdom	900	1,050	1,581	1,390

Source: Office of the Prime Minister, Analysis and Evaluation of Rural Job Creation Project, 1980-85, p.82, cited in Jitsuchon, 1990.

3.7.4 Price guarantee and price support policies

Since 1976 the government has intervened in the market on an ad hoc basis, with special schemes to guarantee or support prices for particular crops. Several government agencies such as the Marketing Organisation for Farmers (MOF), the Public Welfare Department, the Agricultural Cooperatives and BAAC have been involved. The Government has drawn capital from various sources including the Farmers' Aid Fund and the budget to intervene in the market when farm-gate prices have fallen below the guaranteed level. The schemes have met with various operational problems including inadequate planning, inability of the agencies concerned to control the activities of rice millers, insufficient funds, transport and poor warehouse facilities (Panayotou, 1985, Jitsuchon, 1990). Although the programmes have received considerable publicity, their effectiveness in terms of increasing returns to farmers are questionable (Jitsuchon, 1990). According to Trairatvorakul's (1984) study of the effects of changes in rice price policy on low-income

1. In 1983/84, 46 percent of the total cash income of farmers in these regions came from non- or off-farm sources (ROFEAP, 1983).

people in Thailand, the beneficial effects of increasing rice prices[1], are minimal. Most of the gains accrue to affluent commercial farmers with large amounts of paddy to sell.

3.7.5 Farmer institutions and credit policy

The origins of the cooperative movement in Thailand date back to 1916 when the first unlimited liability credit cooperative was established at the village level. The Cooperatives' Act of 1928 was superseded by that of 1968 which enabled the amalgamation of village-level societies and the establishment of the Cooperative League of Thailand as the apex organisation (Toommanee, 1989). During the Third National Economic and Social Development Plan (1972-76) much attention was paid to building up the membership and physical infrastructure of the district-level cooperatives and tambon-level Farmers' Associations formed in 1974, as organisations to provide integrated credit, input supply and marketing support to farmer members. At this time, the reorganisation of the various types of land and credit cooperatives into multi-purpose units with a three-tier structure at the national, provincial and district levels was considered to be one of the most important steps in the development of Thai agriculture (NESDB, 1972).

By 1976 however the developmental role of the cooperative movement was being seriously questioned due to their slow rate of growth and general inefficiency[2]. Although membership increased by 71 per cent during the Plan period, only 10 to 15 per cent of the nation's agricultural households were registered members (NESDB, 1977). Moreover membership was unequally distributed between regions and the small average size of loan compared to that for direct BAAC clients (see section 5.1.2) was considered to be a major disincentive to farmers joining (NESDB, 1977). Demaine's (1976) conclusion from a study of the effectiveness of cooperatives in Northeastern Thailand was that:

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1. Through the reduction of the rice premium and abolition of the export tax.

2. Cooperative repayment rates (defined as the proportion of funds due actually repaid on time) to BAAC dropped from 19.7 per cent in 1972 to 13 per cent in 1976 (BAAC records).

> "In the provision of credit and the supply of agricultural inputs, the organisations continue to benefit mostly the larger more wealthy farmers. In this way they have been helping to widen inequalities at the local level and create rifts in the traditional society" (Demaine, 1976, pp.18).

During the 1980s there was a concerted effort to try to improve the functioning of cooperatives and increase their effectiveness as vehicles for rural development in Thailand. The Agricultural Cooperatives Restructuring Programme was carried out from 1981-83 and the National Agricultural Credit Training Institute (NACTI) established, partly with international funding[1] to provide training for cooperative managers, credit officers, accounts officers and marketing officers so as to upgrade the management capability and business performance (Devoy, 1987). BAAC also provided training courses for cooperative personnel in order to improve their loan delivery and collection function[2]. An account of BAAC's involvement with the agricultural cooperatives through the credit programme is given in Chapters IV and V.

Despite all of the problems within the movement, the government remains committed to the promotion and support of agricultural cooperatives throughout the country. In the past, national policy towards the cooperatives has not been clearly defined and they have functioned as vehicles for credit rather than for any other developmental purpose. For cooperatives to play a significant role in government strategy to support the agricultural sector, there is a continued need to improve their managerial capacity and repayment record, provide incentives to staff and develop an integrated service including not only credit but input supply, marketing and savings mobilisation. Cooperative activity should complement rather than compete with the activities of BAAC so as to provide an efficient and equitable service nation-wide.

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1. The European Commission provided substantial support to NACTI during the latter half of the 1980s.

2. The BAAC's General Manager acted as Director of NACTI from 1984-87.

3.8 Summary and Conclusions

This chapter has sought to review the problems and policies which have characterised the course of rural development in Thailand since the mid-1970s. In aggregate terms the growth of the agricultural sector has been very impressive compared to other Asian countries. However now that the land frontier is effectively closed and with pressure on land from a growing agricultural population, improvements in productivity heavily depend upon further intensification of the production process through wider adoption of yield-increasing inputs, new cultivation techniques and a shift into activities which give a higher return per unit of land and labour expended. In order to work towards these objectives and at the same time alleviate poverty, government policy from the Fourth Plan onwards has incorporated many elements of a uni-modal development strategy, including specific recognition of the needs of small and marginal farmers who have limited capacity to improve productivity and make a significant contribution to national output. An assessment of the impact of the various policy initiatives taken with regard to land, infrastructure and service provision since the mid-1970s however shows that the policies appear to have had mixed results and had a reinforcing effect on existing inequalities both spatially and by economic group. The success of any further attempts to counter-balance the trend towards a bi-modal development pattern, will depend on the willingness of concerned government agencies to work in a co-ordinated manner to provide increasing numbers of farmers with access to the types of inputs and support services, including credit and opportunities for non- and off-farm employment, necessary to release the income-generating potential of the small farm sector.

The Bank for Agriculture and Agricultural Cooperatives has been one of the main instruments of government policy with respect to supplying funds to finance the intensification process and reduce rural inequalities. The characteristics and developmental effects of the Bank's lending programme are the main concerns of the following chapters.

CHAPTER IV

THE FARM CREDIT SYSTEM IN THAILAND

4.1 Introduction

This chapter describes the characteristics of the rural financial market in Thailand and the role and performance of each of the main financial intermediaries[1] with respect to the provision of farm credit. The structure and characteristics of the Thai financial market as a whole is shown in Table 4.1. Following an overview of the rural financial market, the chapter discusses the characteristics of the informal and formal markets, before focusing on the Bank for Agriculture and Agricultural Cooperatives (BAAC), the central interest of this study.

Figure 4.1 summarises the structure of the agricultural credit delivery system in Thailand. The Bank of Thailand (BoT) is at the heart of the rural financial market, monitoring credit flows and amending banking regulations as necessary. The commercial banks provide most of the funds for agriculture, both directly to farmers and through a number of intermediary institutions. The BAAC, a state enterprise, is the most important of these intermediaries, though the commercial banks are only one source of its operating capital. The Agricultural Cooperatives and Farmers' Associations, supervised by the Cooperative Promotion Department and the Department of Agricultural Extension respectively, on-lend funds received chiefly from BAAC but also from the commercial banks, to farmer members throughout the country. A number of other agencies including the Agricultural Land Reform Office, the Public Welfare Department, the Cooperative League of Thailand, and various non-government organisations provide supporting services and limited amounts for credit mainly through the farmer institutions. Alongside the formal institutions is the informal market consisting of private money-lenders such as traders,

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1. Financial intermediation has been described as "the process by which an intermediary obtains claims on real resources for some individuals or institutions in the community and then re-lends these claims to some other individuals or institutions in the community" (Padmanabhan, 1987, p.1)

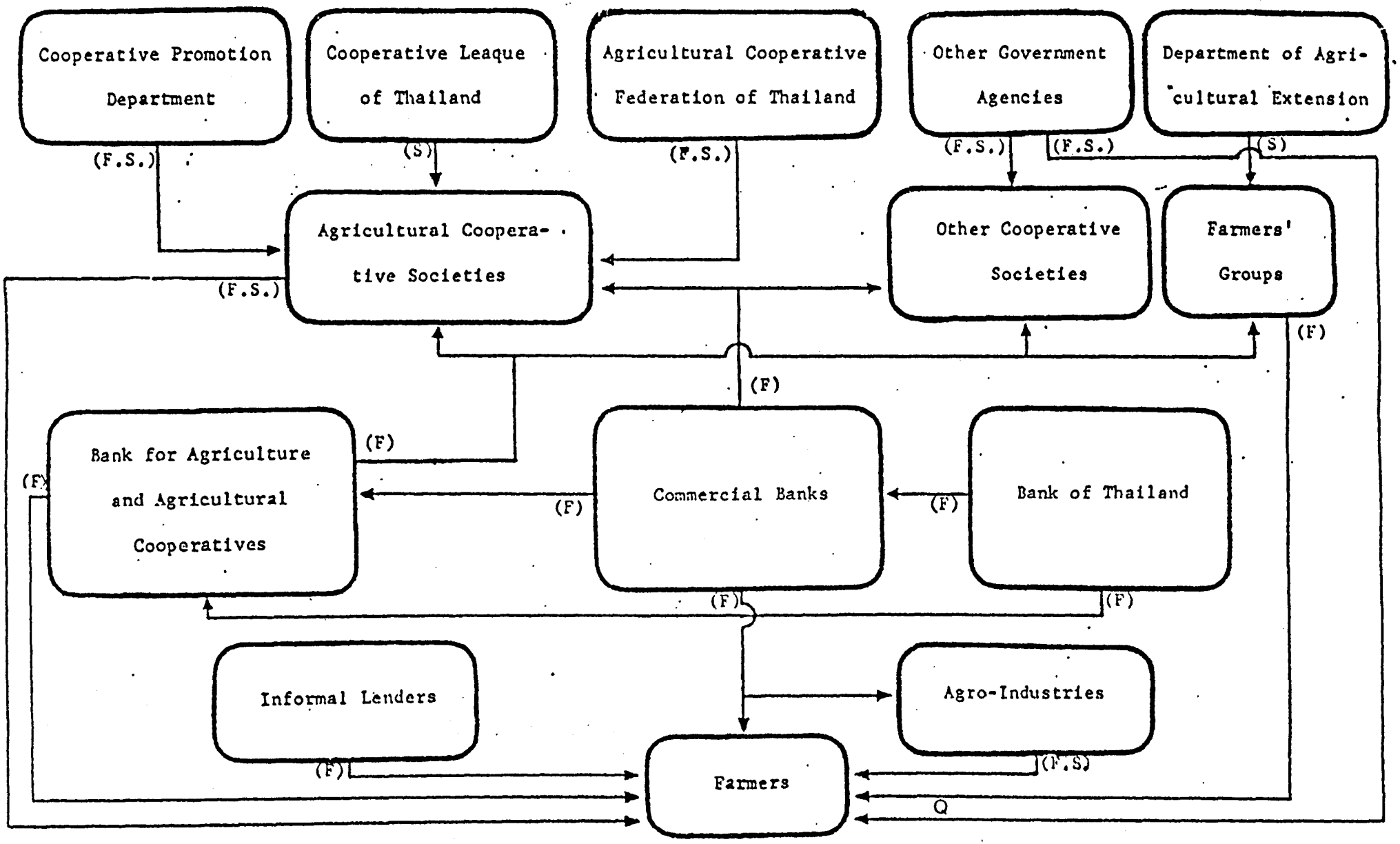
landlords, relatives, neighbours and friends who have historically provided the bulk of farm credit in Thailand. Although the informal lenders are independent of the regulations which govern the formal or institutional system, they do nevertheless acquire some of their funds from formal institutions through loans and overdraft facilities (Onchan and Thanomvongthai, 1985).

Table 4.1: Financial Institutions in Thailand, December 31, 1985 (billions of baht)

Institutions	No.	Deposits equivalent	Borrowing	Household savings mobilised	Credit extended	Invest-ment	Total assets
Commercial banks	30	559.8	70.6	457.2	552.3	85.1	701.9
Finance companies	100	84.0	23.0	58.1	98.1	11.0	131.0
* BAAC	1	15.3	9.8	2.6	21.6	0.8	28.5
* IFCT	1	-	9.4	-	7.8	0.3	15.0
* GHB	1	7.1	5.2	7.1	11.2	0.1	13.7
*a/ SIFO	1	-	-	-	-	-	0.1
* GSB	1	56.6	-	56.1	1.4	57.7	64.8
Agricultural cooperatives	1132	0.4	4.5	1.3	5.8	0.1	7.6
Savings cooperatives	611	1.5	0.5	11.5	13.9	-	15.7
Pawnshops	333	-	3.2	-	4.6	-	5.1
Credit companies	25	2.1	1.1	2.1	2.8	0.2	4.2
Life insurance companies	12 12	14.6 14.6	-	14.6	7.2	5.5	18.4
Total	2248	741.5	126.3	610.6	696.8	160.9	1005.8

* BAAC: Bank for Agriculture and Agricultural Cooperatives
IFCT: Industrial Finance Corporation of Thailand
GBH : Government Housing Bank
SIFO: Small Industries Finance Office
a/ Total assets 57 million baht, of which 41 million were in loans
Source: Bank of Thailand, 1985, cited in Greenwood (1985).

FIGURE 4.1 FUNDS AND SERVICES RELATED TO AGRICULTURAL CREDIT IN THAILAND



F = Funds
S = Services

SOURCE: BANK OF THAILAND

4.2 Credit Availability Pre-1975

Prior to 1975 the involvement of formal financial institutions in rural lending was very limited. Only five of the twenty-nine existing commercial banks were extending loans to agriculture, which in 1974, amounted to only 1.9 per cent of total disbursement (Table 4.2) and met approximately 1.5 per cent of total demand for production credit (BoT, 1981). Farm credit extended by BAAC was also limited due to a shortage of operational funds and a highly conservative lending policy. The informal market was the main supplier of credit for agricultural production.

Table 4.2 Agricultural Credit Compared to the Total Amount of Credit Supplied by Commercial Banks 1970-74
(million baht)

Year	Agricultural Credit (1)	Total Credit (2)	(1) as % of (2)
1970	637.4	28,234.2	2.3
1971	742.7	31,179.8	2.4
1972	771.2	35,845.7	2.2
1973	990.5	51,291.2	1.9
1974	1,305.3	68,815.7	1.9

* Excludes deposits with BAAC
Source: Bank of Thailand, Task Force on Agricultural Credit Development (TFACD), 1981.

4.3 Government Intervention

The year 1975 was an important turning point for the development of the formal credit system in Thailand. In an attempt to increase the amount of capital available for rural lending, the Bank of Thailand imposed a quota system that required the 29 domestic and foreign commercial banks to channel a certain proportion of their outstanding loans at the end of the previous year to the agricultural sector. The quota was set at five per cent in 1974 and was increased in steps to seven per cent of total deposits at the end of the previous year in 1976-77, to 11 per cent in 1978 and to 13 per cent in 1979, allowing two per cent for agri-business. Since 1985, the BoT has required the commercial banks to lend 20 per cent of total deposits in the rural areas. Of this amount a maximum of six per cent can be lent for agri-business concerns[1] (World Bank, 1990). Those commercial banks unable to disburse the set

1. This change was not however reflected in BoT figures until 1987, see Table 4.11.

quotas directly through their branch networks are required to deposit the balance of the stipulated amount with BAAC paying interest on the funds at the current rate.

In a second measure introduced in 1975 designed to increase farmers' accessibility to funds and prevent the drift of capital to Bangkok, BoT permitted unrestricted opening of commercial bank branches in the provinces, provided that at least 60 per cent of the deposits mobilised locally went into agricultural ventures (BoT, 1980). This move, together with the quota system, greatly increased the volume of funds channelled into the rural sector and began the gradual transformation of the system. The amount of institutional credit disbursed to agriculture increased from 1,305 million baht in fiscal year (FY) 1974 to 6,076 million baht in 1975 (BoT, 1980) and to 42,063 million baht in 1983, with approximately 32 per cent lent directly and indirectly by BAAC (Table 4.9). The increase from 1976[1] to 1983 was 288 per cent after taking account of inflation. The great infusion of funds to the formal financial market marked the start of a gradual decline in the importance of the informal sector. According to figures published by the BOT, from 1975 onwards a higher percentage of Thai farmers borrowed from formal sources than from the informal market. Table 4.3 shows the percentage of farmers borrowing by source from 1971/2 to 1982/3.

Table 4.3: Percentage of Thai Farmers Borrowing by Source 1971/2-1982/3 (%)

	INFORMAL	FORMAL				
Year	Total	BAAC	Commercial banks	Coops & Farmer Assocs.	Other	Total
1971/2	63.65	11.93	8.83	15.59	-	36.35
1975/6	42.53	33.36	6.46	17.65	-	57.47
1976/7	36.97	39.17	7.49	16.37	-	63.03
1978/9	36.12	35.46	9.41	19.01	-	63.88
1980/1	42.10	26.65	11.51	19.36	.38	57.90
1982/3	33.81	39.10	10.81	15.15	1.13	66.19

Source: BoT, 1985 modified from table quoted in Sell (1988).

1. 1976 was the base year for calculation of the consumer price index. A different weighing system was used prior to 1975.

4.4 Characteristics of the Informal Market

The informal market consisting of private lenders, traders, landlords, relatives and neighbours has traditionally been the main source of consumption and production credit in rural areas. Informal credit is still important to the rural economy, although from field observations and from the limited amount of information available from published work, the role of informal credit has declined considerably as a result of the greater availability of loans directly from formal sources. The percentage of rural households borrowing from informal sources declined from 64 per cent in 1971/2 to 34 per cent in 1982/83 (Table 4.3). The true extent of the decline is however difficult to gauge for two main reasons: Firstly, farmers are often unwilling to provide full and accurate information, partly because they prefer not to admit the full extent of their informal loans, and partly because they do not always recognise financial transactions with relatives and friends as loans. Secondly, the incidence of informal borrowing varies spatially and seasonally. Generalising from the findings of ad hoc surveys may therefore give a misleading impression of the true scope of the informal market.

Informal loans in rural areas take numerous different forms, ranging from very loose arrangements with no set repayment date or interest charges in cash or in kind, to loans with conditions as formalised as they would be for a loan from a financial institution. Consequently any typology of informal loans is difficult in that many of the loan agreements which may be observed in the field will not fit unambiguously into a single type; even the distinction between formal and informal loans is not always clear, due to the retailing of formal loans in rural areas (Onchan and Thanomvongthai, 1985). Nevertheless for the purposes of discussion it is useful to distinguish between loans borrowed from informal and those from formal sources.

4.4.1 Trends

Table 4.4 brings together the results of various studies carried out since the early 1950s to illustrate trends in rural indebtedness by year, location and source. From the studies listed below, the levels of recorded debt have increased from 947 baht per household in 1953 to 55,447 baht per household in Pongpaichat's study in one village of the Central Plain in 1982, which seems particularly high. In 1965 90 per cent of the value of rural debts was attributed to informal sources. However, in line with the aggregate figures in Table 4.3, more recent studies indicate that in most cases there has been a significant decrease in the relative importance of informal loans, particularly since the mid-1970s. In BAAC's study in five

Northeastern provinces in 1982, only 19 per cent of borrowing was from informal sources with short-duration loans of rarely more than 500 baht (BAAC, 1983)

Table 4.4: Results of Selected Studies on Rural Indebtedness, 1953 to 1983

Study	Year	Location	Incidence of debt (%) of families	Level of debt (baht/ family)	% instit-utional	% informal
Ministry of Agriculture	1953	Central	45	947	n.a	n.a
Udhis	1957	Central	50	n.a	n.a	n.a
Peters	1961	Northeast	<50	n.a	n.a	n.a
Udhis	1967 a/	Central	83	6,072	n.a	n.a
Thisyamondol	1965	Central		6,956	n.a	n.a
		North		1,377	n.a	n.a
		Northeast		1,398	n.a	n.a
		South		1,360	n.a	n.a
		Thailand	68	3,716	10	90
Tongsiri	1973	Chiengmai	n.a	n.a	42	58
Onchan	1973	Chainat	72	3,044	23	77
Thani* and Pittackwong	1976	Chiengmai	24	7,945	42	58
Pongpaichat	1982	Central	60	55,447	43	57
		Northeast	29	4,724	46	54
		North	9	9,995	71	29
BAAC	1982	Northeast	n.a	2,112	81	19
World Bank	1982	Frontier	n.a	15,270	25	75

* Cash only
a/ Surveys carried out in 1965, but results published in 1969.
Sources: various (see bibliography).

Regional variation

Onchan's (1979) assessment, from descriptive studies dating back to the 1950s, though less current, shows more consistent evidence that the volume of debt varies by region and has increased over time. Although there are differences in the scope and methodology of the studies used, the general patterns suggest increases in the incidence of debt in all regions, with the possible exception of the Northeast, and higher levels of indebtedness, particularly in the Central and Eastern regions where agricultural development has been most rapid (Table 4.5).

Table 4.5: Incidence of Debt (%) by Household (hh.) and Mean Debt per Household (baht) 1963-1976, by Region*

Region	1963/4		1971/72		1974/5		1976/7	
	% of hh. (bt.)	Mean debt	% of hh. (bt.)	Mean debt	% of hh. (bt.)	Mean debt	% of hh. (bt.)	Mean debt
Central Plain	75	6,656	50	4,053	79	7,562	78	7,786
East	n.a	n.a	29	1,648	82	10,527	88	8,719
North	49	1,377	13	510	52	2,735	53	3,290
South	52	1,360	13	518	66	2,909	67	3,323
Northeast	61	1,398	27	483	60	1,996	60	2,552
Thailand	68	3,717	27	1,050	68	5,240	70	4,999

* No data available for Western region; these provinces are included with the Central Plain.
Source: Onchan (1979), taken from studies by various authors.

Frontier areas

An interesting dimension of the informal credit market is indicated by the results of surveys carried out by the World Bank (1982) in Northern and Northeastern frontier areas settled between 1965 and 1980 (Table 4.4). According to the study, about 50 per cent of Thailand's present cultivated area has been settled since the mid-1960s, and provided land for about 1.7 million farm families, a third of the national total. Data collected in these areas in the early 1980s suggested that the informal market was supplying about one-third of the total value of loans to farmers. All of the households in the study borrowed, with a mean debt of 15,270 baht per household. In total, three-quarters of the loans were from non-institutional sources, of about seven months duration and carried a mean interest rate of five per cent per month. Even where the formal market had penetrated an area, the informal market was still very important. The formal market was found to be more established in long-settled areas, particularly as a source of production loans.

Farm-size and tenure

The incidence of debt and the relative importance of formal and informal sources has also been found to vary by scale of the farming operation and by tenure. Thani and Pitackwong (1982) noted these tendencies in the Chiengmai Valley, where the level of

formal borrowing increased with farm-size and was greatest among full-owners. Full tenants tended to borrow in equal proportion from both formal and informal sources. Onchan (1973) demonstrated that the level of household debt increased in Chainat province in the Central Region, from 1,815 baht for small-scale farmers defined as those with less than 30 rai to 5,143 baht for large-scale farmers with over 60 rai.

4.4.2 Sources

Sinsarp and Somboonsarp (1976) report that small farmers tend to rely more on relatives and friends as sources of loans, either because they do not qualify for loans, or they do not wish to borrow from formal sources. However the majority of small farmers with less than 11 rai, and tenant farmers borrowed from informal sources including traders and private money-lenders and paid interest rates of between 25-35 per cent per year. Few surveys have however investigated the sources of the informal lenders' funds. In a study of the informal credit market and the development of non-farm enterprises in Thailand, Onchan and Thanomvongtai (1985) learned from unstructured conversations with banking officials, money-lenders and farmers that much of the informal credit in rural areas[1] is financed by the commercial banks, either as overdrafts or as loans "for agriculture" (see section 4.5.3).

4.4.3 Interest rates

Interest rates for the informal market appear to vary widely depending on location and the relationship between the lender and borrower. Thisyamondol et al., (1965) showed that monthly interest rates ranged from 1.8 per cent from relatives to 3.5 per cent from landlords and local storekeepers. The mean rate from private sources was 3.3 per cent. Other studies have shown that relatives and friends are often the main sources of informal loans in rural areas and do not charge any interest on transactions involving small amounts and of no fixed duration. In Chainat, Onchan (1973) found that 30 per cent of loans came from relatives and friends with a mean monthly interest rate of less than 1 per cent. Interest is also known to be paid "in kind", for example 1 tang (10-12 kgs) of rice per 100 baht borrowed. Table 4.6 summarises the interest rates charged on loans from different formal and informal sources during the period 1971/2-1982/3. The average interest rate charged in 1982/83 was 30 per cent per year, with traders being consistently the most expensive among the informal lenders.

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1. Including illegal share and "chit" fund operations.

Table 4.6: Interest Rates on Informal Loans Charged to the Thai Farmer (% per annum) by Source

Year	Source: Relatives	Neighbours	Landlords	Traders	Millers	Others	Average
1971/2	17.73	24.08	20.94	33.62	n.a	4.29	24.98
1975/6	28.80	39.00	32.60	49.44	n.a	21.50	38.62
1976/7	22.00	29.50	24.10	37.44	n.a	29.50	29.31
1978/9	22.08	44.28	47.04	48.12	n.a	20.16	37.43
1980/1	26.09	32.29	36.69	36.69	20.60	51.53	32.16
1982/3	16.99	33.35	15.35	38.07	29.44	23.05	29.76

Source: Bank of Thailand, 1985: Informal Money Markets in Rural Thailand, Mimeo. quoted in Sell (1988).

Informal lenders remain in business because they lend on relatively flexible terms, do not require complicated application procedures, the loans are unsupervised and the borrower has more control over loan size (Onchan, 1973; Padmanabhan, 1988). Since lenders know the credit-worthiness of the borrowers, detailed investigations of economic status are not necessary and informal loans are more accessible, more reliable, may be no more expensive than institutional loans (see section 2.4.2) (Adams and Nehman, 1979). Informal loans may often be used to repay formal loans when farmers are unable to generate sufficient income from on-farm sources and are unlikely to be completely replaced by the formal sector, principally BAAC. The informal sector remains important to farmers who are too poor to borrow from formal institutions and for those in "tied" patronage relationships with landlords and traders who provide a ready market for harvested crops. The results of one survey in Nakon Ratchasima province in 1984/5 show that the farmers who reported a need to borrow but were unable to were the worst-off with regard to all measures of income and landholding (Table 4.7).

Table 4.7 Average Household Income and Land Holdings Classified by Borrowing Behaviour (baht)

Borrowing behaviour	Total family income	Net farm income	Off-farm income	Farm size
All households	35,271	3,169	15,690	21.0
Need to borrow:	37,253	4,254	14,794	24.3
- formal sector only	45,558	6,235	14,762	35.9
- informal sector only	30,626	2,666	14,271	16.4
- both sectors	47,673	6,392	16,957	33.7
- cannot borrow	25,016	3,463	12,610	11.6
Do not want credit	32,400	1,597	16,989	18.2

Source: Taken from Yuavares Tubpun in Siamwalla et al. (1989), p.150.

4.5 Characteristics of the Formal Market: Commercial Banks

4.5.1 Introduction

Commercial bank lending to agriculture takes place in accordance with the resolution of the Thai Bankers' Executive Association, under which BoT sets the ceiling rate of interest on lending to the agricultural sector. In practice, the terms and conditions offered by each commercial bank vary in relation to their policies and objectives. Most banks provide agricultural loans on terms agreed with the borrower and the results of a feasibility study for each loan. The following table shows the interest rate structure for the commercial banks from 1983 to 1986.

Table 4.8: Commercial Bank Interest Rates, 1983-86

	1983 Dec.	1984 Dec.	1985 Dec.	1986 Jan.
Inter-bank lending rate (weighted average)	14.94	10.97	15.03	12.95
Loans and overdraft (ceiling)				
Priority sector (including agriculture)	17.50	17.50	17.50	15.00
Others	17.50	19.00	19.00	17.00

Source: Bank of Thailand Quarterly Bulletin, March 1986.

4.5.2 Disbursement

As shown in Table 4.9 the volume of agricultural credit extended by commercial banks has increased dramatically since 1974. Between 1981 and 1983 the volume of credit for agri-business increased by 35 per cent. A significant change since 1981 has been the increase in commercial banks' direct lending to farmers. Direct disbursement increased by 97 per cent between 1981 and 1983 while the amounts deposited with BAAC increased by only 13 per cent.

Table 4.9: Agricultural Credit Extended by Commercial Banks and BAAC 1975-1983 (million baht)

Year	COMMERCIAL BANKS Direct lending	% increase p.a.	Deposits with BAAC	Loans to agri-business	Total	BAAC Total lent	TOTAL* for farmers
1975	2,234	4.2	1,671	-	3,905	3,842	6,076
1976	3,811	6.7	3,161	-	6,972	4,300	8,111
1977	5,892	9.4	4,528	-	10,420	5,486	11,378
1978	8,100	10.5	5,511	6,383	19,994	6,701	14,801
1979	9,970	11.1	6,330	7,756	24,056	7,955	17,925
1980	11,553	11.4	7,000	9,962	28,515	8,285	19,838
1981	14,457	12.5	7,804	9,932	32,193	10,659	25,116
1982	20,140	15.7	8,405	10,706	39,251	11,799	31,939
1983	28,613	18.8	8,806	13,410	50,829	13,450	42,063

* Excluding loans to agri-business

Source: BAAC and Agricultural Development in Thailand: Experience, Problems and the Corporate Plan 1985-89 (BAAC, 1985).

4.5.3 Loan size

The commercial banks generally deal with commercially-viable large-scale farmers who require substantial amounts of capital to conduct their business operations. Although accurate figures are difficult to obtain due to confidentiality of accounts, using data from selected provinces, it has been estimated that the average size of an agricultural loan from a commercial bank is about 123,657 baht. For the Bangkok area, mean loan size was estimated at 2.19 million baht, compared to 371,171 baht in the Central region and 41,621 for the Northeast (Siamwalla et al., 1985[1]).

4.5.4 Quota system

Despite the marked increase in the volume of direct lending to the agricultural sector in recent years, the commercial banks still have difficulty in reaching the annual disbursement target for agricultural lending. In general the banks are not in favour of the quota system which compels them to channel a certain proportion of deposits to agriculture (World Bank, 1990). The banks perceive lending to the agricultural sector to be high risk, and are reluctant

1. Figures from draft report presented in 1985. Full report published in 1989 (see bibliography).

to deposit funds with BAAC due to the low interest rate on offer (Table 4.10), compared to what could be earned in lending to other sectors (Table 4.7).

Table 4.10 : Interest Rates on Deposits for BAAC and the Commercial Banks (% p.a), FY1984/85

Rates on deposits (% p.a) Time	Savings	BAAC	Commercial banks
		a/	c/
10-11.5	8.5	14.0	15.5
		b/	d/
		15-16	17.5

a/ Seasonal production loans to direct clients
b/ Long-term loans
c/ Prime rate
d/ General rate
Source: Agabin (1988).

The Bank of Thailand has only limited authority to monitor commercial bank accounts and frequent abuses are known to occur each year in the attempt to reach the target. There is for example evidence that many of the loans categorised as having been disbursed for "agricultural purposes" are actually used for non-agricultural ventures such as construction projects and financing airfares and other costs of farmers going to work in the Middle East (Siamwalla et al., 1985). Loan diversion and the disbursement of very large loans which earn more interest from credit-worthy individuals, are symptomatic of the banks' opposition to the quota system. Due to their inherent conservatism and, despite its dependency, BAAC's limited absorptive capacity for funds[1], the commercial banks often fail to reach the disbursement target for loans to agriculture[2] (Table 4.11). The manner in which

1. The commercial banks' fiscal year is from January to December, while that of BAAC is from April to March the following year. It frequently happens that towards the end of the year, individual banks request BAAC to accept large amounts of capital in order to meet their targets for agricultural lending. The offers usually come too late in the agricultural year for BAAC to disburse the funds and the offers are usually declined.

2. A report from the World Bank sees the lax enforcement of the agricultural lending quota as a "blessing in disguise" because agricultural lending does not have a strong economic justification. The report suggests it would be preferable to substitute a formal easing of the requirement for the present lack of enforcement (World Bank, 1990).

commercial banks are currently disbursing credit to the agricultural sector appears to be reinforcing regional and income disparities across the country.

Table 4.11: Agricultural Credit from Commercial Banks as a Percentage of Deposits (%)

	Agricultural Credit					Agribusiness				Total	
Year	Direct credit	Target	Short fall	Deposited with BAAC	Target-DC+BAAC	Credit	Target	Target -actual	Total	Target	Target -actual
1975	3.19	5.00	1.81	2.40	.59	-	-	-	5.59	5.00	.59
1976	4.35	7.00	2.65	3.60	.95	-	-	-	7.95	7.00	.95
1977	5.50	9.00	3.50	4.22	.72	-	-	-	9.70	9.00	.72
1978	6.19	9.00	2.81	4.21	1.14	5.50	2.00	3.50	12.38	11.00	1.38
1979	6.33	11.00	4.67	4.02	-.65	5.63	2.00	3.63	12.31	13.00	- .69
1980	6.42	11.00	4.38	4.01	-.37	5.70	2.00	3.70	13.30	13.00	.30
1981	6.77	11.00	4.23	3.63	-.60	4.62	2.00	2.62	12.96	13.00	.04
1982	7.82	11.00	3.18	3.27	.09	4.16	2.00	2.16	13.51	13.00	.51
1983	8.91	11.00	2.09	2.74	.65	4.18	2.00	2.18	13.88	13.00	.88
1984	8.92	11.00	2.08	2.37	.29	4.53	2.00	2.53	13.44	13.00	.44
1985	7.71	11.00	3.29	2.18	-1.11	4.83	2.00	2.83	11.88	13.00	-1.12
1986	7.31	11.00	3.69	2.03	-1.67	4.97	2.00	2.97	11.31	13.00	-1.69
1987	9.00	14.00	5.00	1.99	-3.02	7.88	2.00	1.88	16.78	20.00	-3.22
1988	9.84	14.00	4.16	1.90	-2.20	7.85	2.00	1.85	17.57	20.00	-2.43

Source: World Bank, 1990

The intention of the government in introducing the quota for agricultural lending in 1975 was to increase the accessibility of small- and medium-scale farmers to subsidised credit. In view of the difficulties described above, it is more desirable from a developmental perspective, for the commercial banks to deposit funds with BAAC than to lend directly to agriculture. At the very least, funds deposited with BAAC will be invested in the agricultural sector, and disbursed in smaller amounts among larger numbers of farmers. Although the interest rates paid on deposits are lower than could be achieved elsewhere, this strategy does relieve the commercial banks of the loan administration costs. From a developmental point of view, if the government continues to operate the quota system in support of the agricultural sector, BoT should have greater authority to enforce the system and monitor commercial bank accounts to ensure funds ear-marked for the agricultural sector are disbursed in an equitable manner for genuinely agricultural purposes.

4.6 The Bank for Agriculture and Agricultural Cooperatives

4.6.1 Introduction

The BAAC was founded in 1966 to replace the former Bank for Cooperatives (BAC), for the specific purpose of channelling funds into the agricultural sector to increase productivity and farm incomes at interest rates below commercial levels. The new institution was to occupy the middle ground between the commercial banks which cater mainly to richer farmers and the informal market which it is the intention largely to displace. The Bank comes under the jurisdiction of the Ministry of Finance, and to a lesser extent, the BoT which is an important source of soft loans and valuable rediscounting facilities. BAAC's activities are controlled by a Board of Directors; the chairman is the Minister of Finance and the vice-chairman the Under-Secretary of the Ministry of Agriculture and Cooperatives (MOAC). Other members include representatives from the Judicial Council, Ministry of the Interior, Office of the Prime Minister, Ministry of Finance, the Budget Bureau, the Bank of Thailand and the Thai Bankers' Association. The BAAC's president is also an ex-officio member of the board. The location of the Bank's branches and the organisational chart are given in Figures 4.2 and 4.3.

4.6.2 Loan types and security

The Bank extends agricultural loans to individual farmer clients, and to farmer institutions including Agricultural Cooperatives and Farmer Associations for various purposes including on-lending to their members. The range of loan types extended by the Bank are shown in Figure 4.4. Approximately 75 per cent of the value of BAAC's total short-term lending under the direct lending programme is through joint-liability contracts[1] in which effectively non-secured loans up to 30,000 baht are given to farmers who are part of a

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1. The Bangkok Bank initiated joint-liability group lending in agriculture as early as 1963. The practice was later abandoned except in the case of special projects.

group held individually and jointly liable for each individual loan[1]. Securing larger term loans requires two guarantors or the mortgaging of fixed assets, usually land. The farmer institutions do not generally use the joint liability concept in conducting their lending operations. Members sign individual loan contracts with the farmer institution concerned and loans are secured by two guarantors or mortgage of property.

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1. Joint-liability groups can vary in size from a minimum of five to a maximum of 50 neighbouring farmers, but generally consist of between 12 and 15 farmers. Each year, group members who wish to borrow for seasonal production costs sign a contract in which they accept liability not only for their own loans, but also for the loans borrowed by other members of the group. In the case of a joint-libaility group being prosecuted for non-repayment, the whole group will be involved in the court action.

Fig. 4.2 Map to show the location of BAAC Branch Offices

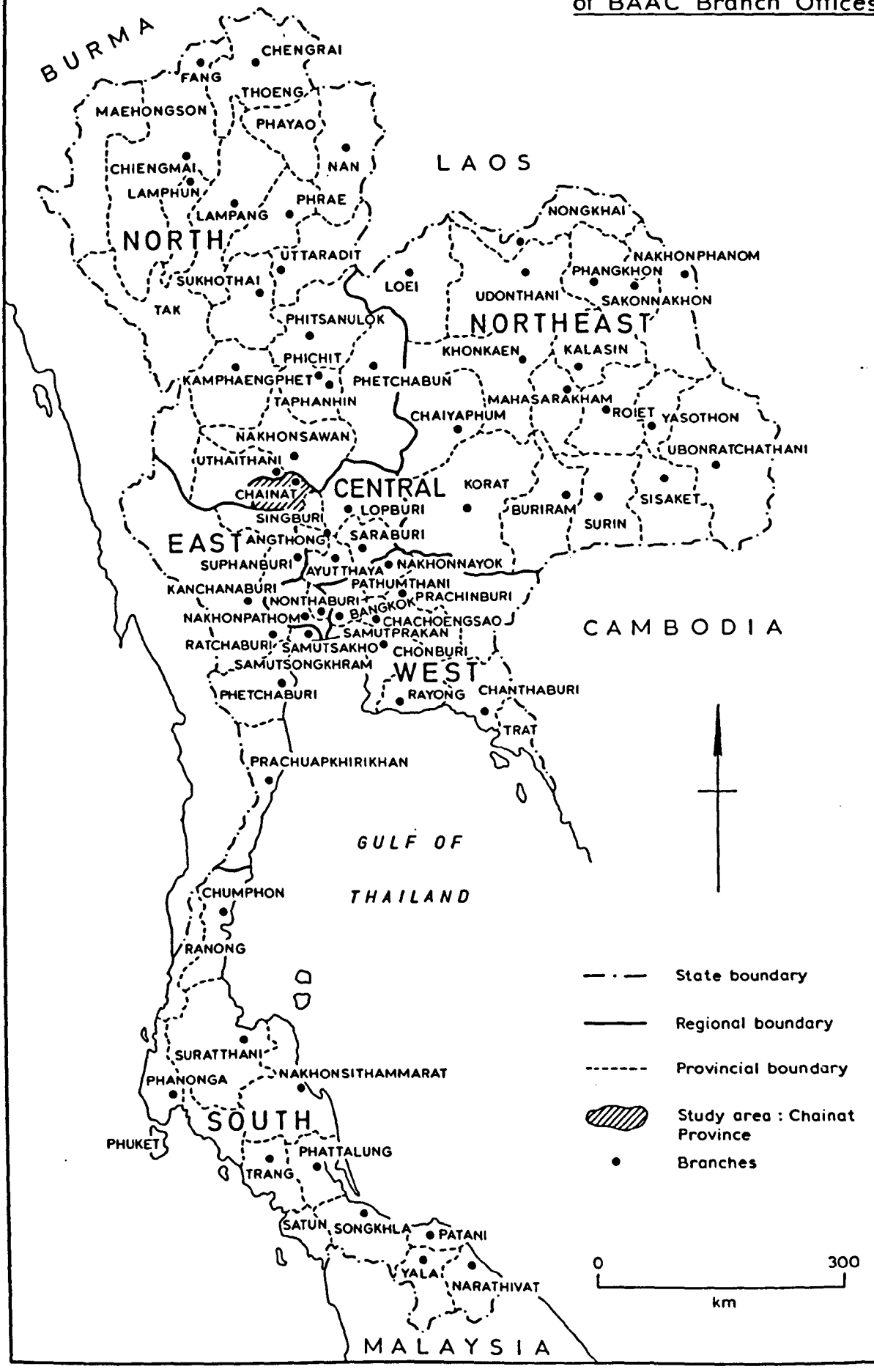
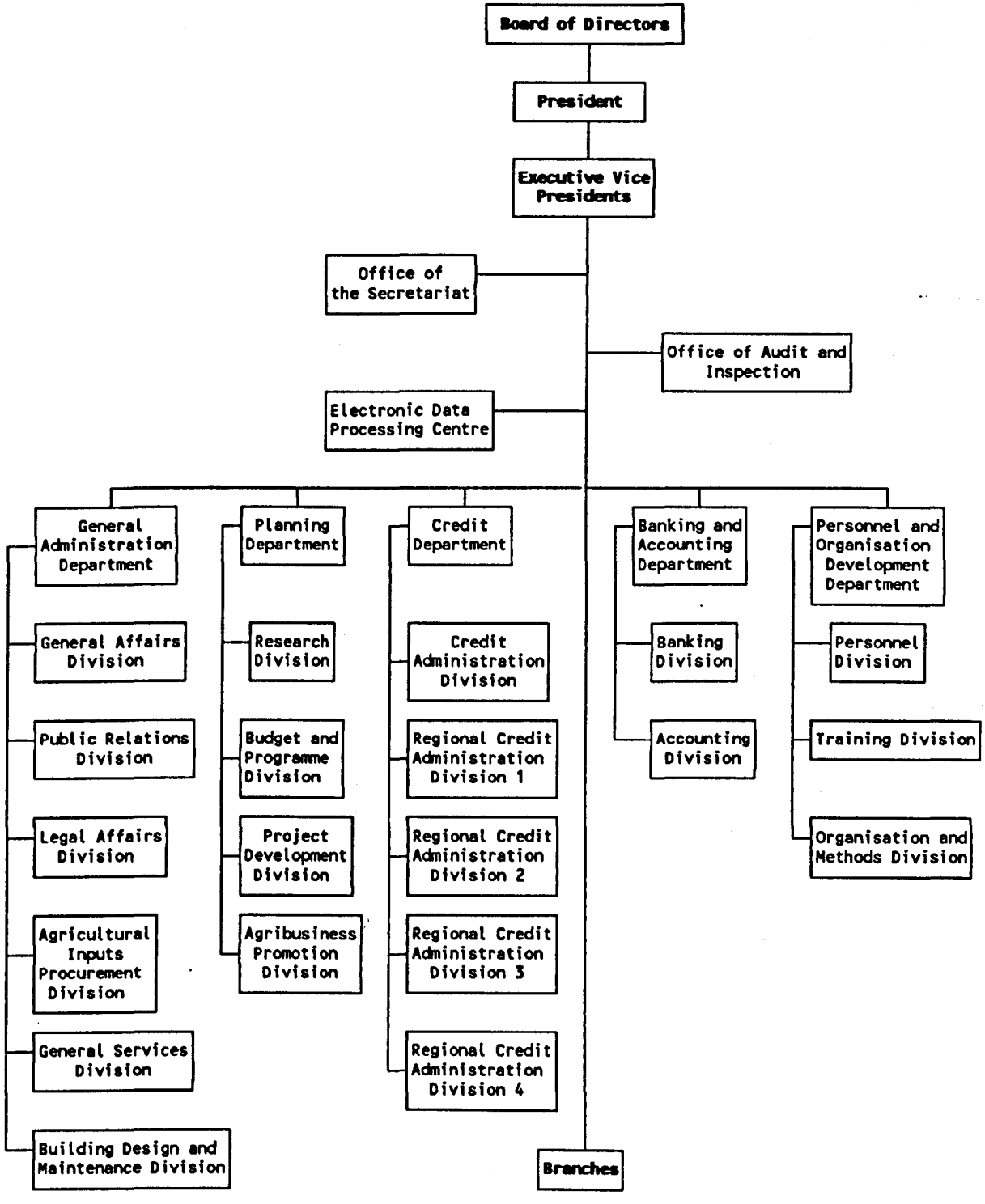
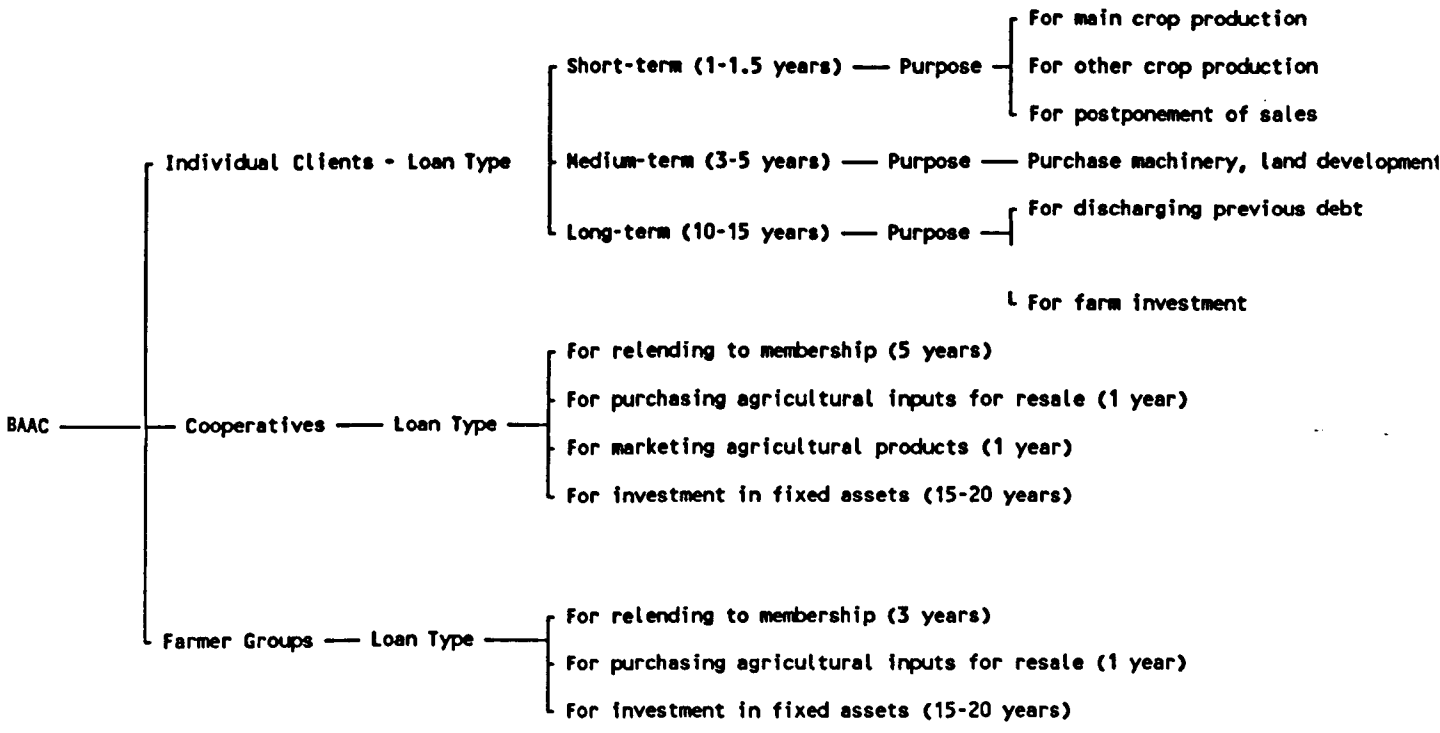


Figure 4.3 Bank for Agriculture and Agricultural Cooperatives Organisation Chart



Source: BAAC Annual Report FY 1989/90

Figure 4.4 BAAC's Loan Operation



4.6.3 Interest rates

The BAAC's interest rate structure is determined by the Board of Directors and varies with national interest rate levels and by loan category. The interest rate structure applied to direct clients and farmers' institutions for the period 1984 to 1986 are shown in Tables 4.12 and 4.13. A penalty rate of 3 per cent is added to the normal rates on all types of loan in the event that the loan falls past due for reasons other than natural calamity. This stipulation has been effective since 1 April 1980 as a means of discouraging wilful default. Increasing the interest rate is a difficult and politically sensitive issue which the BAAC initiates infrequently even through it would ease the financial constraints under which it operates considerably (see section 4.6.7).

Table 4.12: Interest Rate Structure on BAAC Loans to Direct Clients, 1984-86

Type of Loan	Interest rate commencing 1/4/84
Short-term loan - for main crop production - for other agric. purposes Medium-term Loan	1. 14 per cent simple interest; 2. 14 per cent simple interest for amounts not exceeding 300,000 Bt; 15 per cent for loan amounts exceeding 300,000 Bt (for cash credit line contracts); 3. not exceeding 9 per cent simple interest for loans from the Special Agricultural Promotion Fund*
Short-term loan for postponement of sale	14 per cent simple interest
Long-term loan for repaying old debts	13 per cent simple interest
Long-term loan for investment in agriculture**	14 per cent for loan amounts not exceeding 300,000 Bt. 15 per cent simple interest for loan amounts not exceeding 1 million Bt. 16 per cent simple interest for loan amounts exceeding 1 million Bt.

* In response to a government directive, BAAC borrowed 83.8 million baht from this government fund.
** Loans utilising the proceeds of borrowings from the OECF are the sole exception at 8 per cent per annum under the first loan agreement, 12 per cent under loan agreements 2-5, and 9.8 per cent per annum under the sixth loan agreement.

Table 4.13 : Interest Rate Structure for Loans to Farmers' Institutions, 1984-86

Type of loan (by institution)	Interest rates commencing 1 April 1984*
Agricultural Cooperatives	
- for on-lending to members	11 per cent compound interest
- for purchasing ag. inputs	11 per cent compound interest
- for marketing ag. produce	14 per cent compound interest
- long-term loan for investment in agriculture	11 per cent simple interest
Farmers' Associations	
- for on-lending to members	11 per cent compound interest
- for purchasing ag. inputs	11 per cent compound interest
- for marketing ag. products	14 per cent compound interest
- long-term loans for investment in agriculture	11 per cent simple interest

4.6.4 Expansion and repayment

Table 4.14 summarises BAAC operations from FYs1981 to 1985, using a number of measures. By the end of FY1985, BAAC had field offices in 580 of Thailand's 674 districts and sub-districts; approximately 1.4 million farmers, or 30 per cent of all Thai farmers were registered as direct clients and a further 20 per cent had access to BAAC funds through farmers institutions, mainly the Agricultural Cooperatives. The scale of the branch and district network and staffing expanded steadily during the period 1981 to 1985. With direct recruitment and disbursement necessary at average annual rates of 8 per cent and 17 per cent respectively. Although the amount disbursed through Agricultural Cooperatives continued to grow at 4.5 per cent per year during the period, the number of cooperatives eligible to borrow declined. BAAC's involvement with Farmers Associations contracted even further with the volume of funds disbursed falling by an average of 23 per cent per annum from 1981 to 1985. The reasons for this fall are given in section 4.6.5.

Table 4.14 BAAC Activities
FYs 1981-1985

Item	FY1981	FY1985	Mean growth rate (%)
No. of branch offices	62	68	2.33
No. of field offices	513	580	3.01
No. of field officers	4,472	5,281	4.49
No. of direct clients	1,038,103	1,381,851	7.72
Loans to direct clients*	8,001	14,143	16.78
No. of client cooperatives	841	825	-0.75
No. of cooperative members	791,483	788,665	-0.45
Loans to cooperatives*	2,577	3,181	4.57
No. of client farmer assocs.	1,308	794	-12.16
No. of farmer assoc. members	230,728	132,208	-14.23
Loans to farmer assocs.	81	26	-23.29

* Millions of baht
Source: BAAC Annual Report FY1985/86

Table 4.15 shows the regional distribution of total combined BAAC disbursement to Agricultural Cooperatives, Farmer Associations and individual clients for 1976 and 1985.

Table 4.15: Distribution of BAAC Loans by Region, 1976-1985 and Mean Loan Size per Registered Borrower

	Total amount disbursed (millions of baht)				Increase 1976-85	Mean loan per farm holding (baht)
Region	FY1976	%	FY1985	%	%	FY1985
North	1,181	27	4,203	24	256	6,650
Northeast	900	21	4,951	29	450	6,355
Centre	789	18	2,538	14	222	11,015
East	347	8	1,940	11	459	12,172
West	697	16	2,048	12	194	9,375
South	404	9	1,669	10	313	5,891
Total	4,318	100	17,350	100	302	7,534

Sources: BAAC Annual Reports FY1976 and 1985.

Twenty-nine per cent of BAAC's loan portfolio was channelled to the Northeastern region in FY1985 an increase from 21 per cent in FY1976. Over the same period, the amount actually disbursed in the region more than quadrupled, an increase of similar magnitude to the Eastern Region which increased its share of the loan portfolio from 8 per cent to 11 per cent over the same period. Despite declining shares in the loan portfolio, amounts disbursed in the Northern, Central and Western Regions doubled and that in the South tripled. Despite the huge increase in the value of disbursements in the Northeast, the country's poorest and most populous region, the average loan size was only 6,355 baht in 1985, almost half the level of the Central and Eastern regions. This is indicative of the extensive nature of the Bank's operation in this region given the limited opportunities for productive investment.

During this period repayments for seasonal production loans to direct clients fluctuated between 76 and 78 per cent of the matured principal, with no discernible trend over time. Most overdue loans were repaid within a year. The amount of principal in arrears for three years remained stable at less than two per cent of the total. Repayment rates for

medium-term loans declined from 61 per cent to 57 per cent over the period 1981-85 while for long term investment loans the figure fluctuated between 61 and 67 per cent over the same period (BAAC Annual Reports, various issues).

Credit in kind

Until 1980 all BAAC loans were disbursed directly to farmer-borrowers in the form of cash. In 1980 the credit in kind programme was introduced, whereby farmers began to receive part of their loans as farm inputs rather than as cash. The reasons for introducing credit in kind were several: firstly, providing farm inputs directly to the farmers was thought to reduce the risk of loans being diverted to other uses; secondly, by providing inputs directly, the Bank's planners saw themselves as being in a position to influence the amount of inputs used per farm and their timely delivery; and thirdly, by purchasing commodities in bulk and at a discount, the Bank was able to channel inputs to farmers at fair prices and introduce competition for local traders. Initially chemical fertiliser was the single largest commodity traded as credit in kind; however since 1983 the value of loans for farm machinery has been marginally greater than that for fertiliser. These two groups of commodities together account for over 90 per cent of the value of all credit in kind disbursements. Small amounts are disbursed in the form of other chemical farm inputs such as pesticides and fungicides.

Table 4.16: Credit in Kind Operations, FYs 1982-85

	1982	1983	1984	1985	Mean growth rate %
No. of private companies registered at Head Office	26	33	66	106	63.38
No. of warehouses at branch offices	8	24	50	55	91.89
No. of client farmers availing of credit-in-kind	267,616	386,626	411,129	512,387	22.26
Value of inputs, equipment and agricultural machinery provided (million baht)	980	1,201	1,709	1,690	21.99
Proportion of total short-, medium- and long-term loans extended as credit-in-kind (%)	10.94	11.36	12.64	11.95	3.78
Chemical fertilisers - volume (tons)	116,285	130,364	203,390	205,597	24.04
Chemical fertilisers - value (million baht)	531	554	824	848	19.74
Agricultural machinery - value (million baht)	400	558	733	663	19.58
Other farm inputs and equipment - value (million baht)	49	89	152	179	55.61

Source: BAAC Annual Report FY1985

Table 4.16 shows total disbursement under the direct lending programme in the form of credit in kind for FYs 1982 to 1985. The scale of the operation has increased steadily from year to year. By 1985, 55 of the country's BAAC branches had their own warehouse from which to display and distribute agricultural inputs and machinery. The proportion of total disbursement extended in the form of credit in kind increased at an average annual rate of four per cent over the four year period, while the number of farmer-clients availing of the service increased by 22 per cent per year. BAAC has become one of the country's main

suppliers of chemical fertiliser (FADINAP, 1990), the amount procured[1] and disbursed having increased by 24 per cent per year. BAAC has also become a major supplier of agricultural machinery, the value of disbursements increased by close to 20 per cent each year during the period 1982-85.

4.6.5 Performance of farmers' institutions

BAAC's business with the farmer institutions deteriorated markedly from 1975 to 1985. The volume of lending to Agricultural Cooperatives declined from 24 per cent of the operational fund in FY1979 to 18 per cent in 1985 on account of their poor repayment performance. BAAC's involvement with Farmer Associations has become negligible for the same reason. The overall repayment rate for Agricultural Cooperatives fluctuated between 37 and 42 per cent from 1979 to 1985 and for the Farmer Associations between 29 and 35 per cent (BAAC, Annual Reports, various issues).

Poor repayment rates have been the main cause of BAAC's reduced involvement with farmer institutions. Since 1976 the Bank has lent to cooperatives on the basis of their business performance. Whether or not a cooperative is permitted to expand and receive the volume of funds requested, depends on its grade which is reassessed each year through an evaluation procedure. Low grade cooperatives are not encouraged to grow until there has been some improvement in business performance (see section 3.7.5). The World Bank has recommended that in the interests of its long-term financial viability, BAAC should phase out lending to grade three cooperatives until business performance improves, and curtail lending to Farmer Associations altogether. While, due to government commitments, lending to Agricultural Cooperatives is unlikely to cease, the phasing out of lending to Farmers' Associations is well advanced. From FY1984 onwards it became mandatory for Farmer Association members with outstanding loans to repay directly to BAAC, rather than to the Farmer Association concerned. Consequently, BAAC loans to Farmers' Associations

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1. During the period 1984-87 a large proportion of the chemical fertiliser disbursed through the credit in kind programme was provided as grant aid by the European Community (see Chapter VIII).

declined by 24 per cent between 1981 and 1985 (Table 4.14).

4.6.6 Sources of funds

The bulk of BAAC's loan portfolio is extended for short-term seasonal lending. The availability of funds each year depends on the recycling of funds collected in repayments from the previous year. In a year of poor repayment due to natural calamity or low crop prices, maintenance of the operational fund depends on alternative sources of funds, the principal one being the commercial banks (Table 4.17).

Table 4.17: Sources of Funds, BAAC, FYs 1978-1985 (% of total).

Year	Deposits	Credit from BoT	Deposits from commercial banks	Foreign liabilities	Capital fund	Other
1978	15.9	15.9	43.9	3.7	14.4	6.2
1979	14.1	17.4	44.0	6.4	14.1	4.1
1980	12.0	26.0	40.4	6.3	11.6	3.8
1981	14.7	18.1	40.4	9.1	11.9	5.8
1982	15.0	16.8	40.2	11.1	11.6	5.2
1983	20.7	13.0	39.1	14.5	10.5	2.2
1984	17.8	11.9	38.1	21.2	8.6	2.4
1985	23.3	7.5	36.4	21.7	9.1	2.0

Source: BAAC Annual Reports, various issues.

Deposits from commercial banks provided 36 per cent of BAAC's operational fund in 1985. This is the most important single source of funds, though its share of the total declined from 44 per cent in 1979 as a result of direct commercial bank lending to the agricultural sector. The contribution from the BoT, traditionally the second largest source of operational funds, declined steadily to reach 7.5 per cent of the total operating fund in 1985. Borrowings from other domestic sources also became relatively less significant as a source of operational capital from 1978 to 1985. The importance of foreign liabilities however increased dramatically from 3.7 per cent in 1978 to 21.7 per cent in 1985, with an annual average growth rate of 27 per cent between 1982 and 1985 (BAAC, 1986). Ninety-seven of all borrowings in FY1985 came from overseas sources including the Japanese Overseas Economic Cooperation Fund (OECF) which had extended six long-term loans to BAAC by the mid-1980s, the International Fund for Agricultural Development (IFAD), the World

Bank and USAID (BAAC Annual Report, FY1985).

Following many years of relative neglect, savings mobilisation from the general public began to make a significant contribution to the total operating fund from the early 1980s onwards, the amount increasing at 15 per cent per year between 1982 and 1985. Savings and time deposits constituted 23 per cent of the total operating fund in FY1985 (BAAC, 1986). The increase in the relative importance of deposits is a particularly desirable trend given the declining growth rate in deposits from the commercial banks and the reluctance on the part of the RTG to incur further overseas debts.

4.6.7 BAAC's financial viability

During the first half of the 1980s, BAAC's overall lending programme expanded at a rate of 14 per cent per year and the Bank had little difficulty securing sources of capital to finance the operation. However funds from the domestic market are expensive and the Bank's own capital fund had not grown in relation to the scale and scope of the operation[1] (Table 4.16). In 1985, deposits from commercial banks carried an interest rate of 12.5[2] per cent which was only 1.5 per cent below the Bank's lending rate and 1.5 per cent above the rate the Bank received on loans to Agricultural Cooperatives (Tables 4.12 and 4.13). Operating costs averaged about 5.5 per cent and the Bank had been able to survive financially by using the Bank of Thailand's discount facility[3] and seeking additional low-cost loans mainly from overseas sources to reduce the average cost of the operating fund.

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1. Shareholders' equity increased by five per cent per year during the period 1982-1985, while the value of promissory notes from the BoT remained static (BAAC Annual Report, 1986).

2. The interest rate on deposits increased from 10-11.5 per cent in FY1984 (Table 4.10) to 12.5 per cent in FY1985.

3. In 1984, the World Bank estimated that the overall subsidy provided to BAAC by the RTG is in the order of 700 million baht per year (World Bank, 1984).

By the mid-1980s however, it was not expected that future sources of funds would allow for a continuation of the low blending ratio. BoT's contribution was expected to become a progressively smaller proportion of total loanable funds, and in view of the government's policy of discouraging overseas borrowing, BAAC could not rely on this source in future. In 1984, the World Bank recommended that all future sources of capital should be expected at market rates of interest. Taking these changes into account, assuming continued annual expansion at 14 per cent[1] and maintaining the interest rates at the 1984 level (Tables 4.12 and 4.13), the Bank's projections showed that BAAC would be making a loss of 895 million baht by FY1990 (World Bank, 1984). It was concluded that progressively increasing BAAC's on-lending rates to take account of the more expensive sources of funds and paying greater attention to savings mobilisation were the only long-term viable alternatives for increasing the Bank's resources and ensuring its financial viability. Largely through a grant injection to the Bank's equity from the European Community (see Chapter VII), further borrowing, and increased savings deposits, this "worst case" scenario did not come about. The World Bank's analysis did nevertheless reveal the vulnerability of BAAC's overall financial position which underlies most of the financing decisions made at the national and provincial levels.

4.7 Conclusions

This chapter has described the characteristics of the rural financial market in Thailand and the role and performance of each of the main financial intermediaries with respect to the provision of agricultural credit. The chapter discusses evidence for the decline in the relative importance of the informal sector in line with the dramatic increase in the availability of low-cost institutional funds for agriculture since 1975. Although the volume of commercial bank lending has increased substantially since 1975 and direct lending is on the increase, it is BAAC that has the policy orientation, network and procedures to distribute

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1. The growth rate required by the Fifth National Economic and Social Development Plan (NESDB).

funds to the agricultural sector in a more equitable manner. The main difficulty on BAAC's part is that of maintaining the financial viability of the operation while continuing to expand and supervise loans in a way that will simultaneously fulfil its developmental and business goals. The ways in which these goals come into conflict are illustrated at various points throughout the remainder of this study.

CHAPTER V

BAAC: THE QUESTION OF ACCESS

Introduction

The strategy for rural development adopted by the Thai government since the mid-1970s extends beyond the traditional concerns of increasing output. The Fifth National Economic and Social Development Plan (1981-86) alludes explicitly to equity goals, namely the reduction of inequalities in rural income distribution and in farmers' access to government support services. Moreover, it has been recognised that in the longer term, output can only be increased through the intensification of agricultural production methods. As the principal source of farm credit in Thailand, BAAC is one of the main government institutions responsible for implementing a rural development strategy directed towards both the equity and the intensification goals. The question is to what extent does BAAC's lending programme contribute to the advancement of these goals? This chapter examines the developmental effects of BAAC's lending programme in terms of the distribution of recruitment and credit flows and the characteristics and performance of farmers who receive loans. The extent to which small-scale rural producers have access to BAAC credit is an important indicator of the Bank's overall success as a development agency.

The chapter is divided into three sections: Section one considers the nature and scope of BAAC's direct and indirect lending programmes and inter-regional variations in recruitment and loan distribution by duration, crop type and purpose. Section two of the chapter makes extensive use of Head Office computer files and data analyses carried out by BAAC's Research Division from 1984-1986 in order to investigate and explain the characteristics of BAAC clients in terms of farm-size, income, the amount of credit received by different groups and repayment performance; the final section provides a summary of the observed patterns and draws conclusions as to the distributional impact of BAAC's lending operation.

5.1 Spatial Variations in Client Registrations and Loan Disbursement

5.1.1 Characteristics of the lending operation

BAAC disburses short-, medium- and long-term loans for various purposes both directly through the branch network, and indirectly through Agricultural Cooperatives and Farmer Associations. The proportion of loans directed through each channel is determined within BAAC, based on perceptions of the most secure outlets for credit, the needs of commercialised farmers in different parts of the country and certain priorities in agricultural development policy as a whole. Within this framework decisions are made about the allocation of funds which intentionally or otherwise determine the degree of access different farmers receive. These decisions affect, for example, the balance in the lending operation between allocations to the direct lending programme as against the farmer institutions; the relative importance given to short-term production loans as opposed to longer-term development loans and project lending; the promotion of certain crops and techniques as opposed to others; the distribution of funds among particular income groups and areas; and the relative importance attached to BAAC's business and developmental goals, insofar as these are not always compatible.

Table 5.1 shows that the direct lending programme is the most important component of the BAAC's operation. Over 80 per cent of total funds were disbursed through the direct lending programme in FY1985, and of this 73 per cent was disbursed as short-term production loans, nine per cent as medium-term and 14 per cent as long-term loans. A total of 18 per cent of total funds was disbursed through the Agricultural Cooperatives in FY1985 and less than one per cent through the Farmer Associations. Of the amount disbursed through farmer institutions, over 95 per cent in each case was for on-lending to the membership in the form of short- and medium-term loans.

For all three organisations, the vast majority of funds are disbursed as short-term loans for seasonal production, that is to promote the country's main annual crops. In FY1985, 86 per cent of direct short-term disbursement was for crop production (Table 5.2). Of this amount 47 per cent went to rice, 11 per cent to cassava and 12 per cent to maize, the country's major agricultural exports. Ten and two per cent of short-term credit was disbursed for livestock and fishery production respectively.

Table 5.1 : Summary of BAAC's Lending Operations FY1985 (million baht)

Lending category	Disbursements	(%)
Direct lending		
- short term	10,314	73
- medium term	1,222	9
- cash credit lines	622	4
- long term for refinancing*	1	a/
- long term for investment in agriculture	1,984	14
- innovations[1]	-	
Sub-total	14,143	
(%)	(81.5)	100
Agricultural Coops.		
- for on-lending to members	3,113	98
- for purchasing agricultural inputs	67	2
- for marketing agricultural products	-	-
- long term for investment in agriculture	1	a/
Sub-total	3,181	
(%)	(18.3)	100
Farmers' Associations		
- for on-lending to members	25	96
- for purchasing agricultural inputs	1	4
- long term for investment in agriculture	-	-
Sub-total	26	
(%)	(.15)	100
Grand total	17,350	
(%)		(100.00)
100.00		

* Loan facility to redeem old debts with private money-lenders which may have included the surrender of land.
a/ Less than 1 per cent
Source: BAAC Annual Report, FY1985.

1. Contractual arrangement made whereby a client's spouse or off-spring undertakes to repay loans on behalf of the client who is unable to fulfill repayment obligations due to death, permanent disablement, or permanent transfer away from the locality.

Table 5.2: Short-Term Loans to Client Farmers Classified by Purpose FY1985 (million baht)

	Disbursement	(%)
A. Crop production		
1. Rice	4,836	47
2. Cassava	1,126	11
3. Maize	1,184	12
4. Sugarcane	505	5
5. Cotton	36	a/
6. Tree crops*	401	4
7. Tobacco	138	1
8. Pineapple	76	a/
9. Kenaf/jute	162	2
10. Legumes	168	2
11. Other**	289	3
Sub-total	8,921	87
B. Livestock and poultry		
1. Piggery	438	4
2. Beef cattle and buffalo	488	5
3. Poultry	80	1
4. Dairying	1	a/
Sub-total	1,007	10
C. Fisheries		
1. Fish culture	102	1
2. Marine fishing	38	a/
3. Shrimp culture	44	a/
4. Others (e.g shellfish)	3	a/
Sub-total	187	2
D. Other production purposes	182	2
Sub-total	182	2
Grand total	10,297	100.0

a/ Less than 1 per cent

* Fruit trees, para rubber, bamboo shoots, tea, mulberry, sugarpalm.

** Watermelons, vegetables etc.

Source: BAAC Annual Report, FY1985.

5.1.2 Inter-regional variations in client registrations and loan disbursements

Recruitment

As of the end of March 1986, 1,381,851 farm-families were registered as direct clients of BAAC and 920,873 with farmer institutions, giving a total of 2,302,724 farm-families or approximately 49 per cent of farm-families nation-wide registered under the "Government Credit Programme" (Table 5.3). On a regional basis the highest proportion of registered farm-families, including members of Agricultural Cooperatives and Farmer Associations, was in the Central Plain (75 per cent), followed by the Western (70 per cent) and Eastern (62 per cent) regions. Taken together to comprise the Central Region, 69 per cent of all farm-households were registered under the programme in 1985. As the country's most agriculturally productive and commercialised area, this region is considered to have the highest "absorptive capacity" for credit. The Northeastern region by contrast has the highest proportion of farm-families (42 per cent), but the lowest percentage of registered institutional borrowers (40 per cent) compared to other regions. This reflects the poor productive potential of the region and the difficulties many farmers face in meeting the Bank's eligibility requirements. In all regions the majority of institutional borrowers are direct clients of BAAC.

Table 5.3: Registered Institutional Borrowers as a Percentage of Total Farm-families, by Region, FY1985

Region	No. farm hhs	% farm hhs*	BAAC clients	% farm hhs	Agricultural cooperat-ives	% farm hhs	Farmers assoc-iations	% farm hhs	Total farm hhs	%
North	1,236,449	26.4	373,083	30.2	211,152	17.1	47,715	3.9	631,950	51.1
North east	1,945,713	41.5	493,890	25.4	252,481	13.0	32,750	1.7	779,121	40.0
Centre	308,772	6.6	127,170	41.2	95,963	31.1	7,307	2.4	230,440	74.6
East	257,242	5.5	83,730	32.5	62,431	24.3	13,225	5.1	159,386	61.9
West	312,813	6.7	118,275	37.8	81,070	25.9	19,122	6.1	218,467	69.8
South	624,466	13.3	185,703	29.7	85,568	13.7	12,089	1.9	283,360	45.4
Total	4,685,455	100.0	1,381,851	29.5	788,665	16.8	132,208	2.8	2,302,724	49.1

* hhs - households
Sources: Agricultural Statistics of Thailand, Crop Year 1983/4
BAAC Annual Report, FY1985.

Disbursement

Taking total direct disbursement in FY1985, approximately 37 per cent of funds went to the Central, Eastern and Western regions collectively, compared with 28 per cent to the Northeast, 24 per cent to the North and 10 per cent to the South (Table 5.4). The distribution of loans through Agricultural Cooperatives followed a similar pattern to the direct lending programme. For the Farmer Associations, half of the total loan disbursement took place in the Northern region and 26 per cent in the South.

Table 5.4: BAAC Lending Operations by Region and Institutional Affiliation, FY1985 (million baht)

Region	Direct lending		Agricultural Cooperatives		Farmers' Associations		Total	
	Amount	%	Amount	%	Amount	%	Amount	%
North	3,449.6	24.4	740.1	23.3	12.9	50.1	4,202.6	24.2
North east	4,023.5	28.4	927.3	29.1	.6	2.3	4,951.4	28.5
Centre	2,055.2	14.5	482.8	15.2	.3	1.2	2,538.3	14.6
East	1,520.9	10.7	415.8	13.1	3.4	13.2	1,940.1	11.2
West	1,703.7	12.0	342.9	10.7	1.7	6.6	2,048.3	11.8
South	1,390.3	9.8	272.2	8.5	6.8	26.4	1,669.3	9.6
Total	14,143.2	100.0	3,181.1	100.0	25.7	100.0	17.350.0	100.0

Source: BAAC Annual Report, FY1985.

Mean loan size

With regard to the average loan size by institutional affiliation in 1985/6, Table 5.5 shows that the highest level was for BAAC clients ranging from 18,164 baht in the Eastern region to 7,486 baht in the South with an average of 10,234 baht for the country as a whole. The equivalent loan-size for a cooperative member was only 4,033 baht, ranging from 6,660 baht in the Eastern region to 3,181 baht in the South. The considerably smaller amounts available to cooperative members reflects the reduced amount of funds available from the BAAC and the small number of members actually eligible to borrow due to repayment difficulties. The negligible average disbursement to Farmer Association members is indicative of the few remaining associations receiving credit for on-lending from BAAC.

Table 5.5: Mean Loan Size by Institutional Affiliation, FY1985

(baht per registered family)

Region	BAAC	Agricultural Cooperatives	Farmers' Assocs.	Total
North	9,246	3,505	270	6,650
Northeast	8,146	3,672	18	6,355
Centre	16,161	5,031	41	11,015
East	18,164	6,660	257	12,172
West	14,404	4,229	89	9,375
South	7,486	3,181	562	5,891
Total	10,234	4,033	194	7,534

Sources: BAAC Annual Report, FY1985

5.2 Lending to Small-Scale Farmers

5.2.1 Introduction

It is only comparatively recently that the BAAC has taken a serious interest in the socio-economic characteristics of its client-farmers. Although a limited amount of information concerning client characteristics is sent to the Head Office from the branches every five years, the data are minimal and there is as yet no routine procedure for analysing it or using the results to guide policy making. Within the Bank's current reporting system, this is the only source of data that will allow any systematic analysis of client characteristics in relation to disbursement and repayments by scale of farming operation over time. Before analysing the extent to which BAAC lends to different farm-size categories however, it is necessary to digress briefly to discuss a) the question of lending to small farmers from an institutional point of view, and b) the definition of small-scale farmer.

5.2.2 The case for and against lending to small-scale farmers

For a commercial bank, the case for and against lending to small-scale farmers is straight-forward; it is unprofitable a) in terms of the higher risk of loan default assumed to be associated with lending to economically-marginal farmers; and b) it increases operating costs because large numbers of small loans are expensive to process and supervise. The second of these considerations is perhaps more likely to influence policy decisions regarding lending to the small farm sector. If rates of repayment and profit levels are taken as the most important

measures of success, then the Bank should not be actively involved in lending to the small farm sector.

BAAC however is not a commercial bank, and its government-assigned role as a development agency, with small- and medium-scale farmers as the target group, is quite clear. Credit is an important catalyst to agricultural development, and the expectation is that BAAC will serve potentially-viable farmers whose only alternative source of credit would be the informal market. The onus is therefore on BAAC to find ways to best identify and serve the credit needs of small-scale farmers, while at the same time giving full consideration to maintaining financial viability.

Defining small-scale farmers

In attempting to assess the extent to which BAAC's funds are equitably distributed, a question that cannot be avoided is that of the definition of "small-scale farmer". In disbursing loans from international agencies in recent years, BAAC has been forced to adhere to set definitions in channelling funds to specified target groups. For example under the first World Bank loan (1979-81), small-scale farmers were defined as those farmers with holdings below the mean farm-size for their province of residence. The International Fund for Agricultural Development (IFAD) in its 1982-84 loan agreement with the BAAC, targeted farmers in the Northeastern region with a net cash farm income of up to 10,000 baht per year.

There are advantages and disadvantages associated with each definition. The argument against using farm-size as the discriminating variable in assessing socio-economic status is that land productivity and the intensity of land use varies greatly in different parts of the country, especially in irrigated and non-irrigated areas. As a result, farmers' total agricultural income may bear little relation to farm-size. A further consideration is that, particularly in the Northeastern region, farmers typically earn between 40 and 60 per cent of their total income from non-farm and off-farm sources (Meyer and Alisbuscan, 1984). In ideal circumstances income would be a more satisfactory measure of socio-economic status than farm-size. However income is difficult to measure accurately and there are few reliable income statistics available, particularly at the provincial and district levels. However,

complete and relatively reliable statistics on farm-size are readily available from the most recent Agricultural Census carried out in 1983.

In addition to deciding which discriminating variable to use, there is still the question of identifying the appropriate farm-size or cut-off point for defining "small-scale" farmers. Average figures may be distorted by a small number of extreme values. Percentile values, on the other hand are not distorted in this way, and are therefore better statistics to use. Taking percentile values allows a specific proportion of all farmers to be defined as small-scale. The median is used as the relevant cut-off point in the analysis presented below.

5.2.3 Farm-size characteristics of BAAC clients

Data are available from BAAC computer files showing the farm-size characteristics[1] of almost 800,000 BAAC clients in 65 provinces. The data have been "matched" with other BAAC data files to allow an analysis of credit distribution and repayments by farm-size category in sections 5.2.5 and 5.2.6. In Table 5.6, the median, as defined by the census is used as the reference point for defining small-scale farmers. In column five the table gives the percentage of all existing BAAC clients who have less land than the median farm-size for their province of residence. Taking the country as a whole, 19 per cent of BAAC clients have less land than the median for their respective provinces, while 81 per cent of clients have more. In all regions except the Northeast the proportion of existing clients who are "small-scale" by this definition is over 20 per cent. In the Northeast however, the proportion is only 11 per cent. Small-scale farmers are highly under-represented among BAAC clients in the Northeast compared to other regions.

Inter-provincial variation is also marked, and more difficult to explain in terms of general economic conditions. Differences between branches in the Bangkok area are considerable. For example in Samut Sakon 42 per cent of clients have less land than the

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1. These forms are used to collect information on clients' economic assets, farm and non-farm activities, income and financial commitments, in order to determine credit-worthiness. The information is updated each time a client applies for a loan and the forms are sent to the BAAC Computer Centre in Bangkok every five years.

median farm-size and there appears to be relatively little bias against small farmers in BAAC's recruitment. In Nakon Pathom by contrast, a prosperous area agriculturally, only 13 per cent of clients have below median farms. In the Central, Eastern and Western regions there are only eight provinces where the proportion of clients with below median-sized farms is less 20 per cent; of these the lowest is Chonburi where only nine per cent of registered clients may be classified as small. By contrast in half of the Northeastern branches less than 10 per cent of the registered clients are small-farmers. In the Northeast the bias against recruiting small-scale farmers is most apparent in Loei. Here only two per cent of clients have below median farms. Conversely the proportions in Roi-et and Nakon Panom, also in the Northeast, are over 19 per cent. A small farmer's chances of being recruited depend on the general level of BAAC activity in each province, as well as the relative importance of small farmers among all clients. As explained in section 5.2.7 variations in branch-level recruitment of small-scale farmers may be explained by differences in working practices and conventions on the part of branch staff.

Table 5.6: BAAC Clients in Relation to Median Provincial Farm-Sizes

Province	No.1/ farms	No. BAAC clients2/	Clients as % of all farms	% of clients below median farm-size 2/
(1)	(2)	(3)	(4)	(5)
Chiengrai	125,331	29,056	23.18	16.72
Payao	60,993	8,540	14.00	10.77
Petchabun	89,653	30,903	34.47	12.79
Phrae	56,488	19,605	34.71	16.26
Sukothai	75,493	19,440	25.75	22.82
Nakon Sawan	96,052	28,854	30.04	21.63
Chiengmai	139,405	37,015	26.55	31.61
Pitsanulok	76,715	21,497	28.02	21.40
Pijit	55,761	28,192	50.56	23.26
Lampang	101,876	19,346	18.99	28.72
Kampengpet	64,825	18,010	27.78	19.23
Tak	29,934	3,131	10.46	5.45
Lampun	43,644	17,501	40.10	27.73
Uttaradit	51,480	18,433	35.81	14.18
Uthai Thani	36,521	15,532	42.53	39.86
Nan	59,442	19,996	33.64	13.88
NORTH	1,163,613	335,051	28.79	21.69

continued...

Province	No.1/ farms	No. BAAC clients2/	Clients as % of all farms	% of clients below median farm-size 2/
(1)	(2)	(3)	(4)	(5)
Udon	153,111	37,339	24.39	n.a
Khon Kaen	91,331	33,623	36.81	12.28
Chaiyaphum	110,805	33,626	30.35	14.93
Korat	193,820	40,023	20.65	9.98
Roiet	134,273	30,995	23.08	19.37
Surin	121,414	24,809	20.43	8.42
Kalasin	91,331	23,154	25.35	7.23
Loei	63,933	18,901	29.56	2.07
Sakon Nakon	93,584	26,570	28.39	12.39
Nakon Panom	84,792	24,313	28.67	19.35
Sisaket	138,258	24,049	17.39	6.16
Buriram	124,711	25,105	20.13	8.41
Mahasarakham	90,224	22,544	24.99	n.a
Ubon	167,964	22,333	13.30	17.02
Yasothon	54,523	17,133	31.42	8.67
Nongkhai	77,363	24,103	31.16	6.09
NORTHEAST	1,791,437	372,390	20.79	11.29
Ayuttaya	42,020	24,068	57.28	26.13
Saraburi	40,343	18,061	44.77	24.61
Lopburi	71,917	21,136	29.39	28.11
Chainat	42,475	15,216	35.82	29.16
Singburi	21,992	5,794	26.35	20.54
Nonthaburi	13,952	4,436	31.79	12.04
Pathum Thani	20,558	3,221	15.67	24.29
Angthong	28,860	11,936	41.36	23.65
Bangkok	21,786	6,133	28.15	19.27
Samut Prakan	13,193	4,744	35.96	12.86
Prachinburi	64,569	15,491	23.99	22.18
Rayong	37,897	10,590	27.94	10.98
Chatchernsao	43,218	15,635	36.18	n.a
Nakon Nyok	19,512	12,097	62.00	26.23
Chantaburi	34,915	8,907	25.51	35.12
Trat	14,822	2,496	16.84	21.64
Chonburi	38,762	10,937	28.22	9.04
CENTRE + EAST	570,791	190,898	33.44	23.20
Petchaburi	37,042	12,506	33.76	23.09
Suphanburi	77,276	29,658	38.38	21.14
Samut Songkram	10,511	3,108	29.57	39.17
Samut Sakon	11,075	4,934	44.55	42.51
Kanchanaburi	52,888	14,717	27.83	29.80
Ratchaburi	51,741	15,450	29.86	17.26
Prachuab.	31,652	13,791	43.57	25.78
Nakon Pathom	44,954	14,782	32.88	13.10
Chumporn	42,253	11,773	27.86	28.60
Ranong	6,075	56	.92	n.a
Nakon Sithamm.	137,707	33,588	24.39	22.69
Pattani	47,715	16,094	33.73	22.61
Pattalung	53,876	14,158	26.28	n.a
Satun	20,734	3,231	15.58	28.28
Songkla	82,540	20,727	25.11	26.41
Surat	61,853	22,424	36.25	34.73
Narathiwat	48,950	15,023	30.69	24.60
Trang	45,962	10,957	23.84	19.94
Krabi	26,694	7,898	29.59	29.11
Pangga	15,113	3,991	26.41	28.31
Phuket	6,134	893	14.56	25.35
Yala	27,037	6,986	25.84	n.a
SOUTH + WEST	939,782	276,745	29.45	24.79
THAILAND	4,465,623	1,175,084	26.13	19.24

Sources: 1/ Agricultural Census, 1983; 2/ BAAC records

5.2.4 Income characteristics of BAAC clients

Table 5.7 shows the income distribution for BAAC clients compared to "non-clients" from a survey of 1,500 farmers carried out in the Northeastern region in 1982. The table shows that among existing clients, 44 per cent had a net annual income of less than 10,000 baht, compared to 74 per cent of the "independent farmers" without affiliation to a formal credit institution and 66 per cent for all farmers in the sample. The proportion of BAAC clients falling into the income categories above 15,000 baht was higher than for other groups. Twenty per cent of BAAC clients had incomes over 20,000 baht compared to only seven per cent of independent farmers and 10 per cent of the whole sample. These figures show that according to the IFAD definition (net annual income of less than 10,000 baht) BAAC has recruited substantial numbers of small-scale farmers, though less than for other categories. The mean income level of BAAC clients was considerably higher than for other groups at 15,436 baht compared to 10,162 baht for the sample as a whole.

The figures in Tables 5.6 and 5.7 provide the first overall statement of BAAC's nation-wide performance in recruiting small-scale farmers. Although there is an definite bias towards larger-scale operators[1], BAAC has recruited substantial numbers of farmers who would be classified as "small-scale" under either of the definitions discussed above.

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1. Demonstrated by Webster, 1985.

Table 5.7: Income Distribution for Clients and Non-Clients in Northeastern Thailand, 1982 (% of farmers in each category)

Net annual income (baht)	BAAC clients		Clients of other institutions		Independent farmers		All farmers	
Under 1,000	1		7		6		5	
1,000 - 2,999	4	44	5	52	14	74	11	66
3,000 - 4,999	11		10		19		17	
5,000 - 9,999	28		30		35		33	
10,000 - 14,999	18		21		14		16	
15,000 - 19,999	17		12		6		9	
Over 20,000	20		17		7		10	
	100		100		100		100	
Mean income	15,436		12,998		8,326		10,162	

Source: BAAC survey of 1,500 farmers, 1982, Northeastern region.

5.2.5 Loan disbursement to small-scale farmers

Aside from recruiting small-scale farmers, to what extent has BAAC disbursed loans to them? Data on this question are again very limited. However some of the figures available are summarised in Table 5.8 which shows total disbursement over the period 1981 to 1983 for a sample of 52,621 farmer-clients from six BAAC branches selected to represent different regions of the country[1], broken down by farm-size category. The data show that loan disbursement to farmers with less than 10 rai has been small. Overall, only seven per cent of total disbursement during this period went to farmers in this category, the proportions for different loan types varying from five per cent for short-term production loans to 11 per cent for medium-term loans. Thirty-one per cent of total disbursement went to farmers in the 10-29 rai and 38 per cent to clients in the 30-59 rai category who may be classified as "medium-scale". Thus BAAC does lend substantial amounts to genuinely small-scale farmers. On the other hand a less than proportionate amount of total disbursement by these six

1. The six branches were Phrae in the Northern region, Lopburi in the Centre; Ratchaburi in the West, Korat in the Northeast, Chonburi in the East and Narathiwat in the South.

branches went to farmers with over 60 rai (24 per cent over the three year period). These figures taken together indicate that the BAAC tends to deal mainly with medium-scale farmers.

Table 5.8 ; Summary of Amounts Disbursed by Farm-Size Category and Loan Type for Six BAAC Branches, FYs1981-83

	Farm-size category (rai)				
	<10	10-29	30-59	60+	Total
Sample size	4,960	20,845	19,199	7,617	52,621
Short-term main crop loans					
Disb. 1981	5,091,761	33,842,242	56,621,889	29,625,125	125,181,017
Disb. 1982	18,605,217	97,818,296	125,419,885	75,546,045	317,389,443
Disb. 1983	17,170,989	91,257,251	123,860,871	77,493,916	309,783,027
Total	40,867,967	222,917,789	305,902,645	182,665,086	752,353,487
Short-term loans for other purposes					
Disb. 1981	3,481,257	16,085,053	17,462,968	11,299,647	48,328,925
Disb. 1982	13,613,693	52,743,463	51,497,898	36,837,218	154,692,272
Disb. 1983	15,121,222	53,669,841	53,298,808	42,420,535	164,510,406
Total	32,216,172	122,498,357	122,259,674	90,557,400	367,531,603
Medium-term loans					
Disb. 1981	1,495,117	6,397,487	6,667,821	3,786,496	18,346,921
Disb. 1982	4,847,312	15,146,838	14,766,367	7,965,900	42,726,417
Disb. 1983	6,327,747	20,252,026	20,222,596	11,680,145	58,482,514
Total	12,670,176	41,796,351	41,656,784	23,432,541	119,555,852
Grand total	85,754,315	387,212,497	469,819,103	296,655,027	1,239,440,942

Source: BAAC records FYs 1981-83

Table 5.9 shows that generally there is a tendency for larger-scale farmers to secure larger loans. However the average loan size does not increase in proportion to the scale of the farming operation. Comparing the top and bottom groups in Table 5.9, while the gross value of crop sales increases by a factor of about five, the value of BAAC loans only doubles.

In other words, as discussed above, BAAC operates what can be described as an extensive rationing procedure (see section 2.4.2). Large numbers of farmers in each farm-size class have been recruited as clients, and once recruited, a farmer with virtually any scale of farming operation will normally be able to borrow money. Loans however tend to be small, and among the larger-scale farmers, cover only a small proportion of total seasonal

production costs. This suggests that BAAC loans are not as critical to the operation of larger scale farmers as they are for small-scale farmers. Thus the chances of using BAAC credit as a policy instrument to affect farmers' behaviour appears to be limited, especially among larger-scale clients. This question is explored further in Chapters VI and VII.

5.2.6 Repayment

One of the main arguments raised against increasing lending to small-scale farmers is that they have limited capacity to repay. BAAC does not have a routine procedure to allow analysis of the relationship between farmer characteristics and loan repayments. However the various pieces of evidence currently available suggest that, contrary to expectations, there is no clear relationship between loan repayment rates and farmers' income level. At the level of individual clients, it has been possible to match up disbursement, repayment and value of crop sales data for a small number of clients in the Northeastern region. Table 5.10 shows that although there are slight differences in repayment rates, these differences do not attain statistical significance; in other words the variations are no more than would be expected from sampling error.

Table 5.9: Distribution of Short- and Medium-Term Loans by Value of Crop Sales

		Short-term loans			Medium-term loans		ST and MT loans		% of all clients	% of value of all loans
Value of crop sales (baht)	(n)	Mean farm size (rai)	% of farmers with loans	Mean loan per farmer (baht)	% of farmers with loans	Mean loan per farmer (baht)	% of farmers with loans	Mean loan per farmer (baht)		
Under 5,000	(306)	28	44	2,872	23	721	58	3,593	24	19
5,000 - 9,999	(341)	35	46	2,878	29	960	61	3,838	27	23
10,000-14,999	(199)	42	50	3,891	30	1,033	67	4,924	16	17
15,000-19,999	(143)	47	47	3,954	32	1,073	68	5,027	11	13
20,000-29,999	(132)	53	50	4,231	24	860	61	5,091	11	12
30,000-49,999	(92)	63	62	6,109	20	837	72	6,946	7	11
50,000 +	(44)	92	66	6,000	20	898	75	6,898	4	5

Source: BAAC short-term loan survey FY1980; BAAC loan records, FY1983.

Table 5.10: Short-Term Repayment Rates by Scale of Farming Operation, Northeastern region, 1981

Gross value of crop sales (baht)	(n)	Amount due 1981 (baht)	Amount repaid, 1981 (baht)	Repaid as % of amount due
Under 5,000	(134)	6,559	5,475	83
5,000 - 9,999	(156)	6,291	5,072	81
10,000-14,999	(100)	7,744	6,507	84
15,000-19,999	(67)	8,439	7,327	87
20,000-24,999	(42)	8,332	7,227	87
25,000-49,999	(81)	9,512	8,115	85
Over 50,000	(29)	9,103	7,929	87
Total	(609)	7,528	6,334	84

Source: BAAC short-term loan survey; loan and repayment records for 1981.

Table 5.11 is also relevant. In Table 5.11 loan repayment rates are analysed among a small sample of farmers in one tambon of Muang district Khon Kaen comparing farmers by farm-size category and whether they are direct clients of BAAC or cooperative members. It is important to note that these farmers are neighbours living in the same villages and subject to the same natural hazards. Again there are differences according to farm-size; but these are very slight compared to the differences between farmers with the same size of farms but affiliated to different institutions.

Table 5.11: Loans and Repayments by Farm-Size Category for BAAC Clients and Cooperative Members, Khon Kaen, 1981-82

Farm-size category (rai)	(n)	Before 1976			1976 and after		
		Amount due	Amount repaid	%	Amount due	Amount repaid	%
BAAC clients							
0-29	(10)	850	550	65	8,200	6,764	82
30-59	(33)	3,621	2,178	60	13,848	11,931	86
60+	(28)	3,821	2,071	54	15,871	13,785	87
Cooperative members							
0-29	(34)	1,352	145	11	12,448	1,882	15
3-59	(37)	542	157	29	11,309	3,359	30
60+	(13)	2,923	215	7	12,087	4,835	40

Source: Household survey, Tambon Ban Kho, Amphur Muang, Khon Kaen, 1981.

Further evidence of small farmer' repayment capacity is provided by the IFAD-funded BAAC-DoAE Pilot Project in Small Farmer Lending operated in the Northern[1] and Northeastern regions[2] of the country from 1984-86. In this case small farmers were defined as those with a net cash farm income, after production expenses, of less than 10,000 baht. A total of 813 farmers joined the project in the first year FY1984 and 1,029 in FY1985. The majority of participants were newly registered clients who would not have qualified to borrow from BAAC under normal eligibility criteria.

Table 5.12 gives repayment rates for both years of the project, FY1984 and FY1985. In the first year, the rate of loan repayment by the due date was 88 per cent for the sample as a whole and over 90 per cent in seven of the 14 districts involved in the project. Five of the districts achieved 100 per cent repayment. The repayment rate for the project was higher than for the BAAC's general lending programme covering short-term loans in all of the pilot project districts in 1984, except Det Udom. In Naa Waa district the rate for the project was 100 per cent compared to only 46 per cent for non-project short-term production loans (BAAC, 1986)

Repayment for the second year of the project was less impressive than the first, at 76 per cent. Nevertheless project repayment was again higher than for the general lending operation in 10 of the 14 districts. One hundred per cent repayment was achieved in Chakkarat and Nonthai. The lower level of repayment in the second year for both project participants and the general lending operation was attributable in large part to the poor rice price which resulted in negative incomes for rice for many of the sampled farmers in Korat province and low levels elsewhere. Investment in farm inputs did not yield the expected results, which in turn adversely affected farmers' ability to repay their loans to BAAC (BAAC, 1986).

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1. Phrae and Nakon Sawan.

2. Mahasarakham, Nakon Panom, Ubon Rachathani, Sisaket and Nakon Rachasima (Korat).

Table 5.12 Repayment Rates for the Pilot Project Compared to Short-Term Loans under the Direct Lending Programme (DLP), FYs1984/5 and 1985/6 (%)

	FY1984		FY1985	
District	Pilot Project	DLP**	Pilot Project	DLP
Wapi Pathum	100	69	82	74
Chieng Yun	97	82	25*	85
Naa Waa	100	47	94	51
Pla Bak	57	53	69	55
Tragan Put Pon	100	91	86	77
Det Udom	60	78	52	71
Huay Thap Than	89	78	65	70
Khluklan	98	80	73	52
Chakkarat	100	98	100	100
Nonthai	100	100	100	99
Tatago	81	69	72	56
Lat Yaw	88	68	82	74
Total	88	75	76	72

* Very low rate due to severe flooding in the 1985-6 crop year.
** DLP - direct lending programme
Source: IFAD Pilot Project Evaluation Report, BAAC, 1986.

Table 5.13 summarises repayment rates by loan type, farm-size and year for a sample of 56,621 clients from the six branches mentioned earlier. With the exception of main crop loans in FY1981 and FY1982, the repayment rates within the smallest farm-size category are generally higher than the rates for other farmers. This is also true for medium-term loans for which the smallest farmers consistently repaid at a higher rate. Considering all loan types and all three years in the bottom line of Table 5.13, the clients with the smallest farms had a repayment rate of 81.91 per cent, which was the highest of all four farm-size categories.

Table 5.13: Repayment Rates by Farm-Size Category and Loan Type for Six BAAC Branches, by Year 1981/2-1983/4

	Farm-size category (rai)				
	< 10	10-29	30-59	60+	Total
Sample	4,960	20,845	19,199	7,617	52,621
Short-term main crop loans					
1981/2	77.76	80.02	81.93	79.70	80.72
1982/3	75.56	78.03	84.37	82.27	81.40
1983/4	83.93	74.91	72.28	80.37	75.72
Short-term, other purpose loans					
1981/2	71.86	63.61	72.09	73.33	69.54
1982/3	74.72	74.10	74.92	74.96	74.64
1983/4	85.57	78.72	71.47	66.11	73.75
Medium-term loans					
1981/2	92.67	87.28	88.26	89.57	88.55
1982/3	101.43	92.51	87.27	90.22	91.29
1983/4	93.19	81.85	76.33	83.73	81.54
Overall repayment rates, all loan types, 1981-83					
	81.91	77.35	77.73	78.32	78.04

Source: BAAC records.

The most important conclusion to emerge from the above tables is that although there are slight differences in loan repayment rates by farm-size, there is no evidence that the small-scale farmers among the BAAC's existing clients repay their loans at rates any lower than those for larger-scale farmers. Institutional factors are much more important than farmer characteristics as determinants of repayment potential.

5.2.7 Budgeting and programming procedure

In order to explain the reasons for the observed bias in the BAAC's lending programme, it is necessary to consider operational strategies employed at the branch level. Branch managers are responsible for overseeing the credit programme with direct clients and

with farmers' institutions. Before the start of each financial year, based on the recommendations of the district offices, each branch manager decides how much credit is likely to be absorbed within his or her operation during the coming year, the aim being a) to increase the amount lent to existing clients, and b) to increase the number of eligible clients. While some of the annual targets are set at a common rate for all branches, the size of the remaining targets for each branch are negotiated with the Budgeting and Programmes Division at the Head Office on the basis of the past performance. When targets have been agreed with all branches, the Head Office proceeds to draw up a financing plan, drawing on various domestic and overseas sources to cover the sum of all the provincial estimates. The branches are then given official notification of their operational targets for the coming year. Each branch is competing not only against itself but against others throughout the country.

While the points emphasised within the Branch Evaluation Scheme and the weights given to each criterion vary from year to year, the system remains almost wholly orientated towards branch efficiency and financial viability. In FY1983 the evaluation procedure included three broad criteria: (1) performance in relation to branch targets for client registration, loan disbursement, repayment and deposits; (2) the volume of accounts processed; and (3) the efficiency of administration with respect to a number of financial measures mainly oriented to branch-level profitability. The relative weights given to these sets of criteria were 22, 35 and 43 per cent respectively.

Although broad strategies for expansion are established centrally and communicated to the branches through directives, seminars and training schemes, the interpretation of directives, such as that to increase lending to farmers in the Northeastern region and to identify viable long-term lending projects is left entirely with the branch managers. The central administration is directly involved with the lending operation only with respect to relatively large long-term loans over 160,000 baht which must be approved in Bangkok. As far as the day-to-day banking operations are concerned, the branch managers have almost complete autonomy in determining the kinds of farmers who are recruited as clients and the purposes for which loans are disbursed. Policy guidelines from the Head Office regarding

which crops or activities to encourage or discourage become subordinated to the general goal of meeting the criteria of the Branch Evaluation Procedure on which the number of promotional opportunities and other fringe benefits each branch receives, ultimately depends. In most cases, these considerations supersede the branch's assumed developmental role. Indeed the unthinking pursuit of targets can in some cases have distinctly anti-developmental effects.

5.3 Summary and Conclusions

In assessing the Bank's contribution to rural development in Thailand, this chapter has focused on the question of distribution with special emphasis on the recruitment of and lending to small-scale farmers. The results of the assessment show that there are biases in BAAC's lending operation at various levels. Firstly, although BAAC exists to provide loans to both individual clients and members of farmers' institutions, BAAC clients receive the bulk of loanable funds and access to much larger loans than members of farmers' institutions. This is due to the latter's poor repayment rates and business performance. There is also bias in lending towards the most agriculturally productive areas of the country, namely the Central, Eastern and Western regions where the opportunities for productive investment from the point of view of the Bank and the farmer are most widespread.

Focusing on the direct lending programme, the majority of BAAC clients cannot be described as among the poorest in the rural community. The chances of a small-scale farmer, defined as having a farm-size below the median for his or her province of residence becoming a BAAC client varies greatly by location and depends on the importance of small-farms within the provincial farm-size distribution and the policies employed by branch managers. The majority of clients may be described as "medium-" and "large-scale" in terms of farm-size. While it is true that the Bank has recruited farmers in all regions who would qualify as "small-scale" under any of the definitions discussed above and have received loans, the bulk of loanable funds are disbursed to farmers who are considered to be "financially secure" despite convincing evidence that the small-scale farmers within BAAC existing clients repay as well as if not better than larger-scale operators.

The biases in BAAC's lending programme are largely explained by the implementation of the Branch Evaluation Procedure which emphasises "sound banking" principles above any overt consideration of providing more equitable access to loans for the small farm sector. Generally there are no incentives within the procedure which actively encourage managers to lend more to this sector or to monitor their achievements in doing so. Regardless of the repayment performance among "potentially-viable" farmers, until generalised policy statements at the national level are translated into targets against which the branches will be evaluated, it is unlikely that equity in the provision of services across economic groups will be a major consideration at the branch-level.

Overall, the results of this chapter suggests that BAAC could do more to raise its developmental profile in the rural areas without undermining its financial position. The main determinants of repayment rates appear to be less the income position of the client than the working practices of the branch- and field-level staff. The loan collection performance of each branch appears to be correlated with a high level of loan supervision and where close working relationships have been established between loan officers and clients. Where that close contact is missing, as in the case of the farmers' institutions, repayment rates tend to be lower even in relatively rich agricultural areas and for longer-term loans. The importance of loan supervision is illustrated by the high repayment rates achieved by the DoAE-BAAC Pilot Project implemented in the Northern and Northeastern regions from 1984-86 where loan supervision and extension support were key components of the project design. The role of these two factors in enabling BAAC to recruit and effectively service larger numbers of potentially-viable farmers is explored in Chapters VIII and IX.

CHAPTER VI

CASE STUDY 1 - PRODUCTION LOANS AND THE FARM-HOUSEHOLD ECONOMY, CHAINAT PROVINCE

This chapter introduces the first set of study villages in Chainat province, Central Thailand, where a field survey was undertaken in 1981 to investigate the role and effectiveness of short-term production loans within the farm-household economy. This chapter has three main aims: a) to describe the selection and sampling procedure for the study villages and households; b) to highlight the agricultural and institutional characteristics of the area; and c) to analyse features of the farm-household economy of farmers interviewed in Nang Lue and Nong Noi - including their land holding and income characteristics, seasonal pattern of borrowing, and sources and uses of loans in the 1980/81 crop year.

6.1 Background

The province of Chainat is located in the northern part of the Central Plain of Thailand, approximately 250 kilometres north of Bangkok. It is a relatively small province in terms of land area, bordered by Uthai Thani to the west, Suphanburi to the south, Singburi to the east and Nakon Sawan to the north. In aggregate terms, Chainat is one of the most agriculturally progressive provinces in the Central region. The province is served by a good road system and is of strategic importance as the site of the main dam on the Chao Praya river, the centre of the region's irrigation system. The Ta Jin and the Noi rivers are also important for irrigation and transport. Over half of the cultivated area in the province is accessible to irrigation (NSO, 1978) and most of the area, with heavy lowland soils derived from clay and alluvium, is ideally suited for rice production. A number of other, mostly leguminous crops are grown on the lighter-textured upland soils, but are of relatively minor importance compared to rice. In 1981, total main crop paddy production in the province was 94,217 tons, approximately seven per cent of the amount produced by the Central region (OAE, 1982/3).

Administratively the province is divided into six districts with a total of 42,475 farm families in 1981, (OAE, 1982/3). In 1979 the mean per capita income was 7,922 baht compared with a mean of 10,306 baht for the Central region as a whole (excluding Bangkok) (NSO, 1979). The province is well served by specialist agencies concerned with agricultural development including ALRO, the Land Consolidation Office (LCO) and the Thailand Rural Reconstruction Movement. However in 1981 their activities tended to be rather localised and involve relatively small numbers of farmers in particular projects. For the majority of farmers, the main institutional contacts were with the DoAE, Agricultural Cooperatives, BAAC, the Royal Irrigation Department (RID) and the Rural Job Creation Scheme.

6.2 The Study Area

Two contrasting districts were selected for the case study, each to represent a differing type of rice farming system in the Central Plain. The first district, Muang Chainat, is extensively irrigated. Depending on water availability, most of the district's farmers have access to irrigation and drainage during the wet and dry seasons. Over half of Watsing district, by contrast, is upland and does not have the benefit of irrigation water. The soils over most of the area are light-textured and sandy in composition, highly porous and heavily leached. Frequent natural disasters[1] give rise to highly unstable yields and low incomes. Agro-economic conditions in the district have much in common with rainfed areas in the Northeastern region.

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1. In 1979, 89 percent fo the rice crop was destroyed by drought, followed by a 66 per cent loss in 1980 due to flooding in the lowland part of the district. In both years, the DoAE met half of the district's seed requirements for replanting free of charge.

6.2.1 Sampling

A multi-stage sampling design was used to select farmers to represent institutional and non-institutional borrowers within the two farming systems. At the first stage, two districts (ampurs) were purposively selected on the basis of the area of riceland under irrigated and rainfed farming. The tambons within each district were then stratified according to the same criteria, and one tambon of each "type" selected. Within the two selected tambons, the study villages were selected on the basis of the following criteria:

a) On the advice of the district irrigation office, the proportion of farmers with access to artificial irrigation facilities;

b) the number of BAAC clients, members of farmers' institutions and "independent" farmers who did not borrow from a formal financial institution, recorded at the respective BAAC district offices; and

c) accessibility by road from the district town.

Three villages in tambon Nang Lue, Muang Chainat and a further three in tambon Nong Noi, Watsing district were purposively selected for the household survey. Each household within the study villages was then stratified according to institutional affiliation i.e BAAC clients, members of cooperatives and farmers' associations and "independent" farmers. Three sampling frames were used as the basis for stratification:

a) The tambon listing of BAAC clients by village, client group number and date of registration, obtained from the BAAC district offices in Muang Chainat and Watsing;

b) tambon listing of cooperative members by village, from the Cooperative Promotion Department in the two district towns. None of the farmers in the sample were members of Farmer Associations as DoAE had not formed groups in the tambons under study;

c) household demographic data by village obtained from the kamnan[1] in each tambon and cross-checked for accuracy with the village headmen. The headmen were also asked to indicate which of the village households borrowed from informal sources only.

Sampling was carried out so as to achieve 100 per cent enumeration of the BAAC clients in each of the six study villages, and an approximately equal number of cooperative

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1. Chief of the tambon elected by village headmen.

and informal borrowers, by stratified random sampling. Allowing for absentees and a small number of farmers who were unwilling to be interviewed, the following numbers of farmers by "type" were included in the household survey. The sample covered almost 10 per cent of the household in Nang Lue and 12 per cent in Nong Noi.

Table 6.1: Distribution of Sampled Farmers by Tambon and Institutional Affiliation, Tambons Nang Lue and Nong Noi, 1981

Institutional affiliation	Tambon	
	Nang Lue	Nong Noi
BAAC clients	58	62
Cooperative members	29	27
Informal borrowers	30	30
Total	117	119

6.2.2 Data collection and analysis

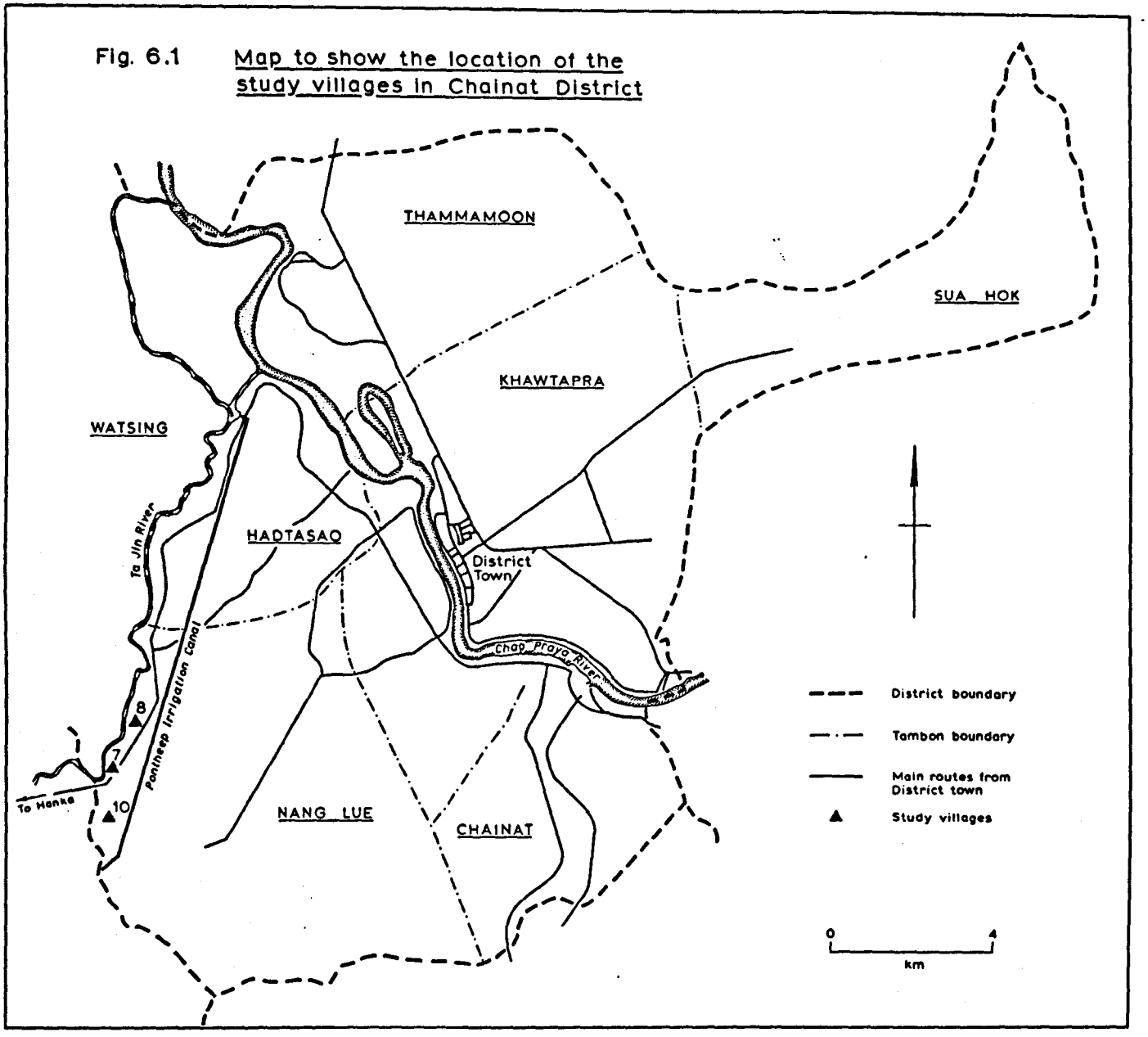
The household survey, including pre-test, was conducted during the period January to June 1981 by a team of two trained interviewers from the Research Division at the BAAC Head Office. The questionnaire covered aspects of the asset, production and income position of each farm including land holding, tenure status, ownership of livestock and machinery, use of inputs, production by crop type, income by source, borrowing and savings behaviour. The household survey was supplemented by informal and semi-structured interviews with administrative and field staff from concerned government agencies, non-government organisations (NGOs), village leaders and farmers to gain a detailed understanding of the problems and constraints faced by the farming communities with respect to credit provision.

Once tabulated and coded, the data were analysed using the SPSS computer software. The main aim of the analysis was to describe the general agro-economic characteristics of the sampled households by farm-size category, focusing on the financial aspects of the farming operation and sources and uses of credit during the 1980/81 crop year.

6.3 Background to the Study Villages: Nang Lue

The three villages purposively selected for the household survey in tambon Nang Lue were Village 7 (116 households); Village 8 (176 households) and Village 10 (46 households). Tambon Nang Lue is located about 20 kilometres southwest of the provincial town, on the left bank of the Chao Praya River. Villages 7 and 8 are linear in morphology, strung out along the tarmac road to Hanka district which runs parallel with the Pontheep Irrigation Canal (Figure 6.1). The villagers' paddy fields lie on the opposite side of the canal from their homes. The original settlement grew up around the temple in Village 7 (Wat Mai) in about 1920, and gradually spread out along the banks of the Ta Jin River. When the Pontheep Canal was completed in 1971, the villagers moved nearer to the canal in order to take advantage of the controlled water supply and the new road. Village 10 was established in 1980 to accommodate migrants from Village 7.

Fig. 6.1 Map to show the location of the study villages in Chainat District



6.3.1 Agricultural production

Table 6.2 shows basic agricultural statistics for Nang Lue compiled by the Department of Agricultural Extension (DoAE). There were a total of 1,229 agricultural households in the area in 1981 and rice farming was the main occupation and source of income for the majority of households. There was widespread use of HYV-chemical fertiliser technology using the RD 7 variety for transplanting, and experimentation with pre-germinated direct seeding[1]. Approximately six per cent of the agricultural land in Muang district was planted by this method in 1980 due to its considerable labour saving potential. Other crops grown in the area including mungbeans and soybeans were of relatively minor importance compared to rice.

Table 6.2: Tambon Characteristics, Nang Lue, 1981

Total agricultural land (rai)	14,755
Area irrigated (rai)	13,810
Area rainfed (rai)	945
Area under paddy (rai)	14,595
Area under mungbeans (rai)	5
Area under soybeans (rai)	10
Other (rai)	20
Paddy yield per rai (tang)	40-60
No. agricultural households	1,229

Source: DoAE, Muang District, 1981.

In the 1980/81 crop year, approximately 90 per cent of the agricultural land was irrigated from either the Ta Jin River, the Pontheep Canal or artesian wells, and virtually the entire area was devoted to transplanted rice. The area planted to the second crop each year

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1. The method involves sub-merging pre-selected healthy rice seeds firstly in hot water for a short period to destroy bacteria and then in cold water for a period of six hours. The seeds are then drained and kept damp for a further 42 hours until a shoot of approximately one centimetre has emerged, by which time the seeds are ready to sow. Careful field preparation is a critically important part of this technique; the fields must be level with no hollows in which water can accumulate. The fields are then partially irrigated and the pre-germinated seeds broadcast onto muddy fields. Although the work involved in initially preparing and levelling the fields and fertiliser and pesticide consumption is greater than for transplanting, the improved yield and savings in labour should render the additional outlay worthwhile.

depends on the availability of water from the same sources. The majority of farmers in Nang Lue had fields close enough to a water source to grow a dry season rice crop which is usually planted in late February or early March and harvested in September, over-lapping with the main crop planted in late July and harvested in December. However in 1980 few of the sampled farmers were able to plant a dry season crop due the water shortage caused by severe drought in 1979. Due to more intensive use of fertiliser per unit area, rice yields for the dry season crop are usually higher than for the main crop; averaging 600-720 kgs/rai compared to 480 kgs./rai for the main crop. Both crops are sold at the farmgate, almost immediately after threshing to merchants from the neighbouring provinces of Singburi and Supanburi.

Before 1970 and the completion of the Pontheep Canal, very few farmers in the tambon owned tractors, the majority relied on draft animals and simple tools for land preparation. With the extension of the irrigation system, increasing numbers of farmers began double cropping and four- and two-wheeled tractors and water-pumps became widespread[1]. Tractors provide an important source of supplementary income during the periods of land preparation, when owners provide ploughing services for a fixed charge per rai. Hara's conclusion that the growth of the tractor rental market has led to the breakdown of traditional labour exchange groups in Central Thailand, the practice known as "long khaek" appeared to hold in this area in 1981. With most farmers using HYVs and preparing fields, planting and harvesting at the same time, labour was short and there was competition among neighbours to complete these operations as quickly and as efficiently as possible[2]. Thus most of the sampled farmers preferred to use tractors and hire labour than await assistance from neighbours and friends.

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1. In 1980, 66 percent of farmers in Muang Chainat owned a tractor and 74 percent owned a waterpump (DoAE, Muang Chainat, 1981).

2. When the majority of farmers used native varieties, "long khaek" was widely practised. The growing season was longer and planting and harvesting were staggered over a few weeks, leaving farmers free to assist each other.

6.3.2 Non and off-farm employment

For farmers unable to grow a dry season crop due to the location of their fields, lack of water or capital, there were many opportunities to raise income from non-farm activities in 1981. The standard rates for agricultural labouring in the area were 80 baht per rai for repairing ditches and dikes, 100 baht per rai for gathering rice shoots and 100-120 baht per rai for transplanting. Some workers were paid in rice instead of cash at a fixed rate per rai. Tractor owners provided ploughing services at a rate of 160-180 baht per rai. Work on local infrastructural projects under the Rural Job Creation Scheme paid about 50 baht per day on a piece-work basis. There was little out-migration from this area to Bangkok during the dry season due to the abundance of non-farm employment opportunities.

6.3.3 Government support services

In general, Nang Lue farmers maintained close contact with local government agencies. In 1981 there was a Housewives Group run by DoAE and an informal Water Users Group organised by a former village headman under the supervision of the RID. The tambon extension officer visited the study villages about four or five times per month to give advice on rice production to individual farmers. The monthly extension meetings held at the headman's house in Village 7 were usually well attended.

6.3.4 The credit market

Almost all of the agricultural households in Nang Lue were registered with a credit institution in 1981; 58 per cent with the district cooperative, 27 per cent with the BAAC and 14 per cent with a farmers' association (Table 6.3). The prevailing on-lending interest rates[1] on direct and indirect loans from BAAC for the 1980/1 crop year were 12 per cent per annum on short-term production loans and nine per cent on medium-term loans. Data on the volume of loan disbursement and repayment by tambon were not available at the time of the survey.

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1. Charged as simple interest.

Table 6.3: Financial Services by Tambon, Muang District, 1981

Tambon	No. of agricultural households	% of households registered with: BAAC	Commercial bank	Coop.	Farmer Assoc.	Total
Nang Lue	1,229	27	-	58	14	99
Chainat	1,092	23	-	7	15	45
Tha Chay	962	3	-	60	7	70
Had Ta Sao	642	7	-	67	10	84
Thammamoon	1,055	9	-	31	7	47
Khaw Ta Pra	980	21	.7	15	8	45
Ban Kluey	545	21	-	17	15	53
Sua Hok	1,135	12	-	38	7	57
Nai Muang	114	3	14	62	-	79
Total	7,754	16	.3	37	10	63

Source: Market research records, BAAC branch, Chainat, 1981.

Despite widespread registration with formal institutions in Nang Lue, there was still some reliance on local money-lenders, usually for funds to supplement institutional loans which were insufficient to cover total production costs, and to meet consumption expenditures during the deficit period before the main crop harvest. The main sources of informal credit for the study villages were local village-based money-lenders, stores, visiting rice traders, neighbours, relatives and friends. The money-lender in Village 1[1], tambon Nang Lue charged five per cent per month interest, as did the visiting traders from Singburi and Supanburi who purchased farmers' paddy. In this case, the requirement was that farmers repaid the principal in cash and the interest "in kind" (paddy) at one tang (10-12 kgs. by weight) per one hundred baht borrowed. The prevailing rate on loans borrowed informally

1. The money-lender in village 1, tambon Nang Lue acted simultaneously as the cooperative group organiser, the local barefoot doctor and ran a plant hire business for local farmers. He also borrowed heavily from BAAC every year. Given his complex cash-flow situation, it was not possible to ascertain whether he was retailing BAAC funds in the local area, charging interest of five per cent per month. However, given the nature of his business, it seemed likely that some BAAC funds were being diverted to this purpose. This is an example of the type of patron-client relationship characteristic of Thai society at various levels. Although the branch staff suspected the farmer was on-lending, they chose to ignore the situation as long as he continued to repay his loans on time, thereby allowing the continuation of a needed, but exploitative practice, exaccerabating dependency among local farmers.

from neighbours was 2 per cent per month, while small loans from relatives and close friends of amounts less than 500 baht, and of a few days or weeks' duration, were interest-free. This type of loan was a normal part of village life and was not considered to be borrowing in the accepted sense. Many farmers also obtained fertiliser in kind from local stores on condition that they repaid in cash after the harvest at an interest rate of 3 per cent per month.

In general, the technological and institutional environment within which Nang Lue farmers operated during 1980/1 may be described as highly favourable to productive investment.

6.4 Background to the Study Villages: Nong Noi

Tambon Nong Noi is located about 10 kilometres south of the district town of Watsing, and 35 kilometres from the provincial town, on the left bank of the Chao Praya River. For the purposes of agricultural extension the district is divided into two parts; the irrigated area comprising 39 per cent of the agricultural land and the rainfed upland area comprising 61 per cent. The villages purposively selected for the household survey were Villages 4, 12 and 15 in tambon Nong Noi, a cluster of 265 households, located close to the border with Hanka district (Figure 6.2). The main agricultural characteristics of the area are given in Table 6.4.

Table 6.4: Tambon Characteristics, Nong Noi, 1981

	Lowland area	Upland area
Agricultural land (rai)	23,871	37,141
Area irrigated (rai)	17,161	-
Area under paddy (rai)	23,654	30,686
Area under upland crops (rai)	10	3,564
Area under orchard (rai)	74	-
Public land (rai)	133	2,891
Paddy yield per rai (tang)	40-60	20
No. of agricultural households	623	364

Source: Department of Agricultural Extension, Watsing District, 1981.

6.4.1 Agricultural production

In the upland area of Nong Noi, soils are predominantly light in texture, sandy in composition, highly porous and infertile. Paddy yield, frequently depleted by annual flooding or drought, averaged only 240 kgs/rai, about half the level in Nang Lue. In general, only farmers who rented or owned fields in the irrigated part of the district, or had access to artesian well water (about 10 per cent of the district's farmers) could attempt to grow a dry season crop. In 1979, a few farmers had started using the pre-germinated rice broadcasting technique. The resulting yields however were still comparatively low due to the poor soil conditions. Farmers usually sold the main paddy crop to local merchants directly after the harvest in December each year.

Although rice is the main crop[1], in view of the absence of irrigation facilities and the low productivity of rice agriculture, the main aim of the DoAE in the area had been to encourage farmers to diversify into upland crops such as cassava, maize, sugarcane, mungbeans, soybeans and groundnuts. Small-scale livestock were however preferred by the villagers and duck raising was the most important secondary occupation. The trade was controlled by Chinese merchants in Watsing town, who provided the necessary inputs including feed and vaccines on credit, and purchased the output of eggs and meat. Although there were good returns to be made from this enterprise, the failure rate was considerable, due to the high input costs and farmers' lack of technical knowledge. Very few farmers owned tractors or water-pumps[2] in 1980/81. The majority hired tractors for the first plough of the season and used draft animals for the second.

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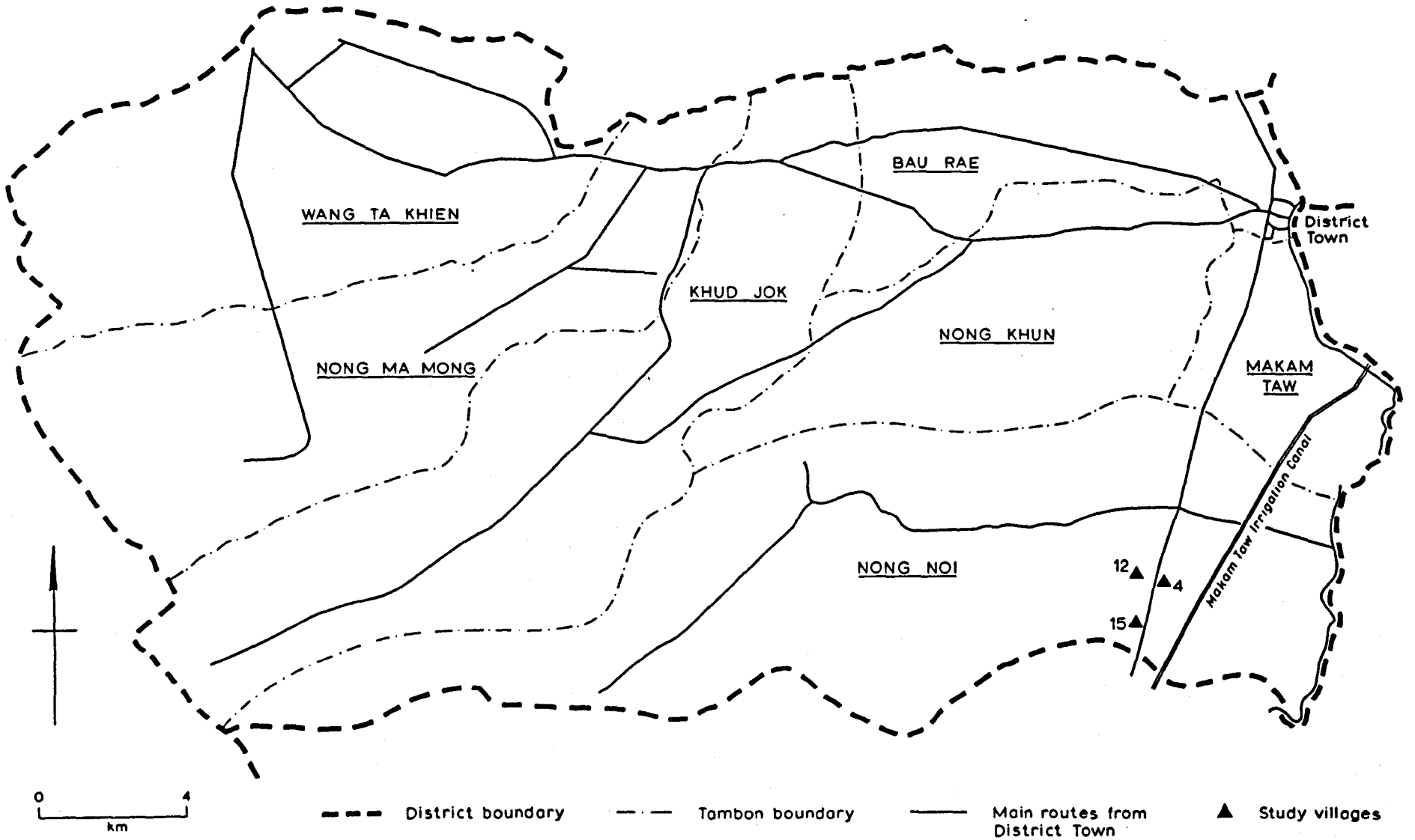
1. In 1981, 80 percent of the cultivated area in Watsing district was planted to paddy, 62 percent of which was transplanted with RD 7, 36 broadcast with native varieties and 2 percent broadcast pre-germinated seeds (DoAE, Watsing district, 1981).

2. DoAE estimated that only three percent of the agricultural households in the district owned tractors in 1981 and one per cent owned water-pumps. (DoAE, Watsing, 1981).

Fig. 6.2 Map to show the location of the study villages in Watsing District



Due to the low responsiveness of the soil to chemical fertiliser, the main way in which farmers in Watsing attempted to increase production was to rent in additional land. Sixteen per cent of farmers were "part-owners" in 1978 and 22 per cent "pure tenants" (NSO, 1978). Pure tenants were among the most impoverished farmers in the district. Rents were usually paid in kind and amounted to one-third of each season's production. Due to successive years of natural disaster between 1975 and 1980, many tenant farmers had been unable to pay their rents and had accumulated heavy debts with landlords[1]. In the years when it was possible to sell some rice, tenant farmers, particularly those growing native varieties often had difficulty obtaining reasonable prices for the crop[2]. Unlike in Nang Lue, informal labour exchange was still widely practised in Nong Noi in 1981, largely among poorer farmers who could not afford to hire labour.

6.4.2 Non and off-farm employment

During the dry season most farmers in the study villages were without full-time employment. Some earned cash from agricultural labouring, mainly in the irrigated part of the district, which paid 100 baht per rai for transplanting and harvesting. Those owning tractors could earn 150-170 baht per rai by offering ploughing services in the irrigated area. A few farmers reportedly went to find work in the timber industry in the neighbouring district of Hanka in Uthai Thani. Chances of employment under the government's Job Creation Scheme were minimal in this area in 1981, and the majority of farmers were left idle during the dry season. Charcoal production was a common year-round supplementary activity for many families. However the derived income was of very low value in relation to the amount of labour involved. On the whole, the opportunities for dry season employment, an important safety net in areas of low agricultural productivity, were very limited.

6.4.3 Government support services

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1. A substantial number of families were forced to buy rice to meet their own consumption needs in 1980/81.

2. The government-run Paddy Price Guarantee Scheme, offered an alternative buyer in this area in 1980/1.

In contrast to Nang Lue, the frequency and effectiveness of farmer contact with the DoAE was very limited in this area. Village meetings were held infrequently and were poorly attended. House visits by the tambon extension officer were rare and the "contact farmer" system was not functioning. Local farmers relied on neighbours and friends and staff from a local NGO-funded integrated rural development project, which was attempting to develop alternative income-generating activities in the area, for technical advice and support.

6.4.4 Non-government support services

At the time of the survey, the Nong Noi Integrated Rural Development Project (NIRDP), funded by the Canadian International Development Agency (CIDA) was being implemented by a senior development officer and an assistant. The project had been operational since 1979. The NGOs were working with about 125 economically disadvantaged families[1] in the study villages to a) develop alternative income-generating activities to rice including pig and chicken raising and sewing for women; and b) to put into practice the concepts "self-help" and "people's participation" through the promotion of community-based schemes such as a paddy bank and sanitation improvement. The project, which was run from the headman's house in Village 4 and was supervised and monitored by the Village Development Committee (VDC) comprising 12 members.

Although the project had encountered a number of serious implementation problems in the early years, most of the participants felt that it had done much to boost morale and welfare among poor farmers and a renewed interest in farming. Despite setbacks caused by drought during the first year of the project, the various activities designed to raise incomes had been relatively successful, as had those to improve health, hygiene and nutrition. Through demonstrating a high level of commitment, the project organisers had gained the trust and respect of local farmers, most of whom were prepared to follow their advice. The

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1. The project organiser estimated that in 1980, 25 percent of the families in the three participating villages were living below the poverty line, which for the purposes of the project, had been delineated at 15,000 baht per family.

organisers' main concern was that the farmers' new attitude to "self-help" and community activity should continue after the project had run its course in 1982.

6.4.5 The credit market

Despite the lack of involvement with government agencies, local farmers did maintain varying degrees of contact with formal credit institutions. From 1,172[1] agricultural households in tambon Nong Noi 87 per cent were registered with financial institutions including 30 per cent with the BAAC, 28 per cent with the Agricultural Cooperative, two per cent with commercial banks and nine per cent with Farmers' Associations (Table 6.5). Cooperative membership was higher than the BAAC in five tambons and lower in four.

Table 6.5: Financial Service by Tambon, Watsing District, 1981

Tambon	No. of agricultural households	% of households registered with:				
		BAAC	Commercial bank	Coop.	Farmer Assoc.	Total
Watsing	60	67	23	10	-	100
Makam Tao	631	24	1	31	24	80
Nong Bua	460	30	.4	8	-	38
Nong Khud	453	25	-	37	20	82
Bau Rae	452	34	1	21	-	56
Nong Noi	1,172	32	4	37	14	87
Khud Jok	1,028	40	1	19	7	67
Nong Ma Mong	645	18	.3	39	-	57
Wang Ta Khien	236	21	.4	29	-	50
Total	5,137	30	2	28	9	70

Source: Market research records, BAAC branch, Chainat, 1981.

The main sources of informal credit in Nong Noi were local money-lenders and traders who charged an interest rate of five per cent per month, or 1 tang[2] of rice per 100 baht borrowed irrespective of loan duration. Many farmers who were attempting to raise ducks, a very capital intensive enterprise, had become heavily indebted to the Chinese

1. There was a discrepancy of 185 households between the DoAE's (see Table 6.6) and BAAC's estimate of the number of farm-households in tambon Nong Noi in 1981.

2. In 1981, one tang of paddy was worth about 35 baht.

merchants controlling the business in Watsing town. Some institutional borrowers who were in default[1] also had to borrow from another source to repay the Bank. The Paddy Bank belonging to the NIRDP project also offered informal loans to members who could borrow in paddy at an interest rate of 20 per cent per unit of paddy borrowed. Small loans of limited duration between relatives and friends often carried no interest charge and were an important survival mechanism in an environment were both agricultural and institutional conditions were non-conducive to productive investment.

6.5 Survey Results: Nang Lue and Nong Noi:

Table 6.6 shows mean values for selected characteristics of the sampled farmers in Nang Lue and Nong Noi for the 1980/81 agricultural year. Unlike 1979/80, this was a relatively normal year in terms of rainfall. The description focuses on the financial aspects of the household economy.

6.5.1 Farm size and land tenure

Mean farm-size for the sample in Nong Noi was 48 rai compared to the district-wide mean in Watsing of 40 rai (NSO, 1978); and 30 rai in Nang Lue, as against 20 rai for the district as a whole (NSO, 1978). The difference between the sample means and the district means may be explained by the sampling procedure which was designed to include a disproportionate number of institutional borrowers, whose farms tended to be of above average size for the local area[2]. Irrespective of farm-size however, the general standard of living and the productivity of rice agriculture was much higher in the irrigated area. The farm-size categorisations were selected to represent the intensive and extensive nature of farming activity in each area and the distribution of farm sizes within the sample. Thirty-five per cent of the small farmers were full-tenants compared with 16 percent of the medium-scale group

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1. Two farmers in the study area, both BAAC clients, had become very heavily indebted to the BAAC and to private lenders. In one case a BAAC client lost 26 rai of land he had mortgaged to a local money-lender and another had lost a well-built house.

2. Mean farm-size for the BAAC, cooperative members and "independent" farmers not affiliated to any financial institution in Nang Lue were 32, 34 and 24 rai respectively and for Nong Noi, 50 rai, 46 rai and 38 rai (Household Survey, 1981).

and three per cent of the large-scale farmers. In Nong Noi, the proportion of full tenants was 32 per cent for the small-scale farmers, compared to 26 percent of the medium-scale and 36 percent for the large-scale group. For the small-scale farmers in Nong Noi, 78 per cent of the operational area was rented. Fifty-nine per cent of the large-scale farmers in Nang Lue rented in additional land to the area owned compared to 4.7 per cent and 48 per cent respectively of the medium- and large-scale farmers in Nong Noi. In this tambon, the additional land was usually rented in the more productive lowland part of the district. The small-scale farmers in Nong Noi were much poorer than either their counterparts in Nong Lue or their medium- and large-scale neighbours with respect to all measures of income including off-farm income, net livestock income and household income.

6.5.2 Income from crop production

Rice was the main cash crop for all of the sampled farmers in Nang Lue and rice with chickens or ducks in Nong Noi. Income from crop production was 11,585 baht for small-scale farmers in Nong Noi compared to 19,141 baht for the same group in Nang Lue. Inter-group income differentials between the medium- and large-scale farmers were less marked than in Nang Lue. For the whole sample in each area, gross margins from crop production were almost three times higher in Nang Lue than in Nong Noi. Interestingly in both areas there was a decline in the gross margin per rai for successive farm-size categories, with the figure highest for the small farmer group in each area.

Table 6.6: Selected Characteristics of Sampled Households by Farm-Size Category, 1980/1

	Nang Lue				Nong Noi			
VARIABLE	Small Up to 20 rai (n=46)	Medium 21-40 rai (n=37)	Large 41 rai and over (n=29)	Sample (n=112)	Small Up to 30 rai (n=28)	Medium 31-60 rai (n=62)	Large 61 rai and over (n=25)	Sample (n=115)
Mean farm size (rai)	15	30	55	30	23	46	82	48
Area rented (rai)	9	8	8	8	18	19	29	21
*								
Tenure (% of sample)								
- full owner	55	57	38	52	43	27	16	29
- part owner	9	27	59	28	25	47	48	42
- full tenants	35	16	3	20	32	26	36	29
**								
Labour available for farm work (no. man-days)	732	841	861	801	620	570	668	604
Gross crop income (bt)	26,156	44,118	77,864	45,479	13,580	25,932	37,116	25,357
Crop production costs(bt)	7,015	10,360	20,585	11,634	1,995	4,006	4,444	3,611
Net crop income (bt)	19,141	33,758	57,279	33,845	11,585	21,926	32,672	21,746
Net livestock income(bt)	2,857	1,903	1,660	2,232	3,164	4,479	3,562	3,959
Other agric. income (bt)	114	47	87	85	-	3	12	4
Net cash farm income(bt)	22,112	35,708	59,026	36,162	14,749	26,409	36,246	25,709
Off-farm income (bt)	5,444	9,127	5,373	6,642	7,118	3,463	3,518	4,364
Other income (bt)	223	14	86	119	1,310	1,566	2,296	1,662
Total household income	27,779	44,849	64,486	42,923	23,177	31,437	42,060	31,735
Institutional loans (bt)	5,760	7,838	9,413	7,392	1,410	3,185	3,752	2,876
Informal loans (bt)	3,352	5,503	1,931	3,694	2,035	2,517	6,440	2,353
Total loans (bt)	9,112	13,341	11,344	11,086	3,445	5,702	10,192	5,229
Savings	2,611	3,008	9,337	4,484	2,398	2,649	1,756	2,397
Gross margin/rai	1,670	1,125	1,041	1,128	504	477	398	453

* A total of nine cases were excluded due to incomplete data.

Source: Household Survey

6.5.3 Crop production costs

Due to greater opportunities for the productive use of inputs including chemical fertiliser and insecticides, the level of expenditure on crop production in Nang Lue was three times greater than in Nong Noi during the same period. Small-scale farmers in Nong Noi spent an average of 1,995 baht on inputs compared to 7,015 baht by their counterparts in Nang Lue, while the large-scale farmers in each area spent 5,444 baht and 20,585 baht respectively. Inter-group differentials in input expenditure were much less marked in Nong Noi.

Table 6.7 shows the relative importance of different items of input expenditure within the total cost of production. In Nang Lue, hiring labour for land preparation, transplanting and harvesting was the main item of expenditure by value for the medium- and large-scale farmers, followed by chemical fertiliser. For small-scale farmers the amounts spent on hired labour and fertiliser were fairly equal. Expenditure on hiring machinery decreased with farm-size, as many of the medium- and large-scale farmers owned tractors; expenditure on oil, petrol and maintenance was highest for these groups. Overall the pattern of expenditure in Nang Lue and the relative importance of different inputs is as one would expect in an intensive rice growing area. In Nong Noi, on the other hand, the priorities in short-term expenditure for crop production reflect the extensive low-input low-output method of production, with limited expenditure on productivity-increasing inputs and hired labour. Hiring machinery was the main item of expenditure for all farm-size groups. Fertiliser was the second most important cost for small and large-scale farmers.

Table 6.7: Crop Production Expenses by Item and Farm-Size Category: Nang Lue and Nong Noi, 1980/81

Item	Nang Lue						Nong Noi					
	Up to 20 rai (n=46)		21-40 rai (n=37)		41 rai & over (n=29)		Up to 30 rai (n=28)		31-60 rai (n=62)		61 rai & over (n=25)	
	baht	%	baht	%	baht	%	baht	%	baht	%	baht	%
Fertiliser	2,108	30	2,165	21	4,853	23	401	20	864	21	1,010	23
Insecticide	275	4	638	6	592	3	113	6	152	4	182	4
Hired labour	2,056	29	3,871	37	7,780	38	353	18	989	25	113	2
Hired machines	918	13	924	9	1,366	7	643	32	1,272	32	1,942	44
Land rental	683	10	1,236	12	2,335	11	275	14	487	12	625	14
Machine running costs	975	14	1,526	15	3,659	18	210	10	244	6	572	13
Total	7,015	100	10,360	100	20,585	100	1,995	100	4,006	100	4,444	100

Source: Household survey

6.5.4 Household income and savings

Table 6.8 shows the percentage contribution of various types of income to total cash income in the two study areas in 1980/81. Net crop income was the main contributor for each farm-size category, but for small-scale farmers in Nong Noi it contributed only 50 per cent of the total, compared to 69 per cent for small-scale farmers in Nang Lue. Livestock production, mainly the sale of chickens, ducks and young buffalo, contributed 14 per cent of total household income for this group. The relative importance of off-farm income as a component of total family income generally declined by farm-size category in each area as the proportion of income derived from on-farm sources increased. The level of savings increased by farm-size category in Nang Lue, but was fairly equal across categories in Nong Noi. The level of savings reported by small-scale farmers in both areas were fairly similar. Large-scale farmers in Nong Noi reported the lowest level of savings of all groups (Table 6.6).

6.5.5 Non-farm income

In both areas the sampled farmers supplemented income from crop production with income from non-[1] and off-farm[2] sources. In Nong Noi, where annual income from crop production was unreliable, earnings from these sources were of particular importance in contributing to total household income, for small-scale farmers (31 per cent). Small amounts of income from raising livestock, cottage industry and off-farm activities such as agricultural

1. Outside the agricultural sector.

2. Local employment within the agricultural sector.

and non-agricultural labouring and petty trading, brought the total family income of this group to 83 per cent of that of their counterparts in Nang Lue (Table 6.8). Interestingly for small- and medium-scale farmers the bulk of off-farm income was derived from agricultural and non-agricultural labouring, while for large-scale farmers income from property rentals including land and machinery was more important. Other activities contributed very little to total family income in Nang Lue. In Nong Noi income from charcoal production contributed four to six per cent of total income for each farm-size category. These results underlie the importance of off-farm work for some family members as part of an overall strategy for increasing family income and generating cash for investment in the farm, especially for small-scale farmers operating under agronomically marginal conditions. Off-farm income may be regarded as an additional or alternative source of liquidity to institutional credit as a means of financing the family farm.

Table 6.8 : Income Structure of Sampled Farmers by Farm-Size Category: Nang Lue and Nong Noi, 1980/81 (%)

	Nang Lue						Nong Noi					
Component	Up to 20 rai (n=46)	%	21-40 rai (n=37)	%	41 rai & over (n=29)	%	Up to 30 rai (n=28)	%	31-60 rai (n=62)	%	61 rai & over (n=25)	%
Net crop income	19,141	69	33,758	75	57,279	89	11,585	50	21,926	70	32,672	78
Net livestock income	2,857	10	1,903	4	1,660	3	3,164	14	4,479	14	3,562	8
Other agri. income	114	-*	47	-*	87	-*	-	-	3	-*	12	-*
Off-farm income	5,444	20	9,127	20	5,373	8	7,118	31	3,463	11	3,518	8
Other household income	223	-*	14	-*	86	-*	1,310	5	1,566	5	2,296	6
Total	27,779	100	44,849	100	64,485	100	23,177	100	31,437	100	42,060	100

* Less than 1 per cent
Source: Household survey

6.6 Characteristics of Borrowing

6.6.1 Amounts borrowed

In Nang Lue, the amount of capital borrowed from formal institutions including BAAC and the Cooperative was about two and a half times the level in Nong Noi, 7,392 baht per person compared to 2,876 baht in Nong Noi, and there was a positive relationship between institutional borrowing and farm-size (Table 6.6). On average, the overall level of informal borrowing was relatively equal in both areas, however for each farm-size category in

Nang Lue, formal sources were quantitatively more important, particularly for large-scale farmers. Given the timing of the survey, coinciding approximately with the end of the fiscal year, the majority of institutional loans should have been repaid.

Borrowing from institutional sources covered 82 per cent of the cost of inputs for small-scale farmers in Nang Lue, 76 per cent for medium-scale farmers and 46 per cent for large-scale farmers. The addition of informal loans brought coverage to 55 per cent for large-scale farmers in Nang Lue and to over 100 per cent for all other farm-size categories (Table 6.6). In Nong Noi borrowing from institutional sources covered 71 per cent of the cost of production inputs for small-scale farmers, 79 per cent for medium-scale farmers and 69 per cent for large-scale farmers in this area. The addition of informal loans covered the total cost of crop production for all farm-size groups. In contrast to Nang Lue, informal borrowing was higher than institutional borrowing for the small-scale group in Nong Noi. Surplus borrowing was used to cover family consumption expenditures during the deficit period between the planting and harvesting seasons.

6.6.2 Seasonality

Farmers' credit needs are usually described as seasonal due to the sharp fluctuations in their liquid asset position at different times of the year (see Figure 7.2). Cash income receipts from crop sales is usually concentrated in the period December to March, which is also the time at which farmers make the largest cash outlays in repaying loans, purchasing household items and making farm and house improvements. Any excess cash from the harvest may be used to build up capital reserves to finance inputs during the next planting season. Depending on the farmer's economic status however, these funds may or may not be sufficient to cover expected farm and household expenses, and he or she may need to borrow additional working capital. The lowest level of liquid assets usually occurs during the growing season particularly during the period September to November, when many households need to borrow for home consumption until the harvest. Limited amounts of cash may be earned from the sale of other crops and from off-farm income during this period which go to meet immediate cash expenses either on the farm or in the household.

Tables 6.9 and 6.10 show the monthly distribution of institutional and informal borrowing among the sampled farmers in Nang Lue and Nong Noi for the 1980/81 crop year. For all farm-size categories, formal borrowing was concentrated in the period March to May, with the highest frequency in April, which coincides with the start of the Banks' fiscal year

and the period of land preparation and transplanting for the main crop. Formal borrowing in both areas was more or less finished by the end of the planting season in July, although the finishing date was slightly later for Nong Noi farmers growing native varieties. There was some institutional borrowing in October and November for other types of farm activities.

Informal borrowing, by contrast, occurred throughout the year for all farm-size categories. In both areas, the majority of loans were taken out during the period March to July to help finance production and household expenses.

Table 6.9: Monthly Distribution of Institutional Borrowing by Farm-Size Category: Nang Lue and Nong Noi, 1980/81 (no. loans)

Farm-size category	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Nang Lue													
Up to 20 rai	2	17	2	3	-	-	-	1	-	-	-	-	25
21-40 rai	7	12	3	2	1	-	-	-	1	-	-	-	26
41 & over	3	14	4	-	-	1	-	-	-	-	-	-	22
Total	12	43	9	5	1	1	-	1	1	-	-	-	73
Nong Noi													
Up to 20 rai	-	3	1	1	1	-	1	-	-	-	-	-	7
31-60 rai	2	13	6	6	1	-	-	1	-	-	-	-	29
61 & over	2	9	3	1	-	1	-	-	-	-	-	-	16
Total	4	25	10	8	2	1	1	1	-	-	-	-	52

Source: Household survey

Table 6.10: Monthly Distribution of Informal Borrowing by Farm-Size Category: Nang Lue and Nong Noi, 1980/81 (no. loans)

Farm-size category	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Nang Lue													
Up to 20 rai	6	4	-	2	3	1	-	2	1	1	-	3	23
21-40 rai	2	1	5	2	2	2	-	2	1	1	1	1	20
41 & over	1	1	-	2	4	1	-	-	1	1	-	-	11
Total	9	6	5	6	9	4	-	4	3	3	1	4	54
Nong Noi													
Up to 20 rai	2	-	3	2	1	2	1	-	-	2	-	1	14
31-60 rai	2	1	5	5	3	1	1	1	1	2	1	-	23
61 & over	4	1	1	1	2	-	1	1	-	-	-	2	13
Total	8	2	9	8	6	3	3	2	1	4	1	3	50

Source: Household survey

6.6.3 Sources of loans

Table 6.11 shows the number of formal and informal loans borrowed by the sampled farmers during 1980/81. Seventy-three formal and 54 informal loans were taken out among the sampled farmers in Nang Lue compared with 52 formal and 50 informal loans in Nong Noi. Small-scale farmers in Nang Lue took out 34 per cent of the formal loans and 43 per cent of the informal loans, compared with 13 per cent of the formal loans and 28 per cent of the informal loans by their counterparts in Nong Noi.

Table 6.11: Sources of Loans by Farm-Size Category, 1980/1

Farm-size category	Institutional		Non-institutional			
	No. of loans	% of total	Money-lenders		Relatives and friends	
			No. of loans	% of total	No. of loans	% of total
Nang Lue						
Up to 20 rai	25	34	5	33	18	46
21-40 rai	26	36	6	40	14	36
41 & over	22	30	4	27	7	18
Total	73	100	15	100	39	100
Nong Noi						
Up to 30 rai	7	13	4	16	10	40
31-60 rai	29	56	12	48	11	44
61 & over	16	31	9	36	4	16
Total	52	100	25	100	25	100

Source: Household survey

In terms of the number of loans acquired from informal sources, small-scale farmers in both areas relied more heavily on relatives and friends who charged little or no interest on short duration loans. Private money-lenders were of relatively greater importance for medium- and large-scale farmers, and charged interest rates of between two and five per cent per month in cash, or from one to three tang of rice per one hundred baht borrowed.

6.6.4 Loan purposes

Table 6.12 shows the number of institutional loans taken out for different purposes by farm-size category. The majority of loans in each area and for each farm-size category were to meet production expenses. Of the small number of loans acquired for other purposes, loans for land improvement including clearing and levelling were most common among the small-scale farmers in Nang Lue, and loans to purchase farm machinery among the medium- and large-scale farmers. In Nong Noi, loans to purchase livestock including chickens and ducks were next in importance to production loans among the few small-scale farmers who had access to institutional loans.

Table 6.12: Uses of Institutional Loans by Farm-Size Category, Nang Lue and Nong Noi, 1980/1

Use of loan	Nang Lue						Nong Noi					
	Up to 20 rai (n=46)		21-40 rai (n=37)		41 rai & over (n=29)		Up to 30 rai (n=28)		31-60 rai (n=62)		61 rai & over (n=25)	
	No. of loans	% of total	No. of loans	% of total	No. of loans	% of total	No. of loans	% of total	No. of loans	% of total	No. of loans	% of total
Crop production	15	60	18	69	12	54	4	57	19	67	13	81
Purchase land	1	4	1	4	-	-	-	-	-	-	-	-
Purchase livestock	-	-	-	-	2	9	3	43	2	7	-	-
Purchase machinery	1	4	3	11	4	18	-	-	1	3	-	-
Land improvement	6	24	2	8	1	5	-	-	2	7	3	19
House improvement	1	4	-	-	-	-	-	-	1	3	-	-
Household expenses	-	-	-	-	1	5	-	-	3	10	-	-
Other purpose	1	4	2	8	2	9	-	-	1	3	-	-
Total	25	100	26	100	22	100	7	100	29	100	16	100

Table 6.13 shows the uses of informal loans by farm-size category in Nang Lue and Nong Noi. Crop production is the main use of informal loans for all farm-size categories, followed by household expenses.

Table 6.13: Uses of Informal Loans by Farm-Size Category, Nang Lue and Nong Noi, 1980/1

Use of loan	Nang Lue						Nong Noi					
	Up to 20 rai (n=46)		21-40 rai (n=37)		41 rai & over (n=29)		Up to 30 rai (n=28)		31-60 rai (n=28)		61 rai & over (n=25)	
	No. of loans	% of total	No. of loans	% of total	No. of loans	% of total	No. of loans	% of total	No. of loans	% of total	No. of loans	% of total
Crop production	17	74	12	60	8	73	9	64	14	61	6	46
Purchase land	-	-	-	-	-	-	-	-	1	4	-	-
Purchase livestock	1	4	-	-	-	-	1	7	1	4	1	8
Purchase machinery	1	4	1	5	-	-	-	-	3	13	1	8
House improvement	-	-	1	5	-	-	-	-	-	-	-	-
Household expenses	4	18	5	25	3	27	3	22	4	18	5	38
Other purpose	-	-	1	5	-	-	1	7	-		-	-
Total	23	100	20	100	11	100	14	100	23	100	13	100

6.7 Conclusions

The objective of this chapter has been to describe the main features of the two contrasting cropping system under study, and the agro-economic and institutional environment within which the sampled farmers were operating in the 1980/81 agricultural year. The discussion indicates that conditions in Nang Lue were highly conducive to intensive rice agriculture, with farmers' having straight-forward access to support services including extension and credit to enable productive investment in the farm. In Nong Noi by contrast the environment was far less favourable. Access to technical support services particularly extension and credit from institutional sources was restricted and there was greater reliance on sources of non-and off-farm incomes especially among small-scale farmers. The sampled farmers in both areas borrowed from institutional sources to finance production costs, though in Nang Lue the amount borrowed as a proportion of total production costs

decreased with farm-size category and was fairly similar across categories in Nong Noi. The following chapter uses the survey data described above to explore the hypothesis that farmers' dependence on production loans to finance production varies by scale of farming operation, farming conditions and farmers' ability to generate working capital from other sources.

CHAPTER VII

THE "CREDIT ONLY" MODEL, CHAINAT PROVINCE

7.1 Introduction

Aside from its role in channelling funds to farmers who would not qualify for commercial bank loans, BAAC extends loans to improve the technology used by recipient farmers, and thereby raise agricultural productivity and income levels. The following assumed chain of relationships provides the reason for the existence of the BAAC and similar government farm-credit institutions

CREDIT ---> FARM INVESTMENT ---> > PRODUCTIVITY ---> > INCOME

If this chain of relationships could be demonstrated not to exist, then the rationale normally given for maintaining institutions like the BAAC would disappear.

However the links in this chain cannot simply be assumed to exist. The relationships are subject to many disruptive influences. There are inevitably competing farm-household uses for cash received in the form of farm credit which may divert loans from their intended uses; technology may be wrongly applied; natural hazards may prevent investments on the farm from leading to the expected increases in productivity; and price variations, marketing uncertainties and the need to share crops with landlords may intervene in such a way that higher incomes do not result from increased productivity.

Before going on to explore the role of production loans within the farm-household economy, it is necessary to discuss the theoretical role of credit and the methodological problems associated with measuring its impact at the farm level. This chapter then goes on to discuss the merits of path analysis as a tool for this type of investigation and finally to test a hypothetical farm-household model and the role of production loans within it, controlling for access to irrigation and farm-size.

7.2 Farm-level Effects of Loans: Theory

In simple terms, loans represent an additional source of liquidity which allow a farmer to make expenditures on the farm or within the household which he or she may or may not have been able to do normally. Within a year expenditure may at times exceed household income, while at other times, income may exceed expenditure and households are net savers (Lee 1983; Meyer and Alisbuscan, 1984). Farm-households are not only heterogeneous in terms of their productive potential but also in terms of their need for financial services to deal with such variations (Meyer and Alisbuscan, 1984).

Adams (1977) explains how a short-term production loan might be expected to affect a farmer's use of inputs. Firstly it is assumed that farmers have insufficient capital resources of their own to adopt new technology and are unable to borrow enough from informal lenders to purchase as much fertiliser as they could profitably use, even though the marginal returns from doing so may be high. Loans may enable a farmer using sub-optimal levels of fertiliser to purchase an additional quantity and therefore increase output (P) and thereby the marginal value productivity of fertiliser use, that is to maximise the incremental revenue which will be forthcoming as a result of greater fertiliser usage. Adams (1977) depicts the possible improvement in a farmer's use of inputs with additional capital as a move from 0 to X_1 on Figure 7.1.

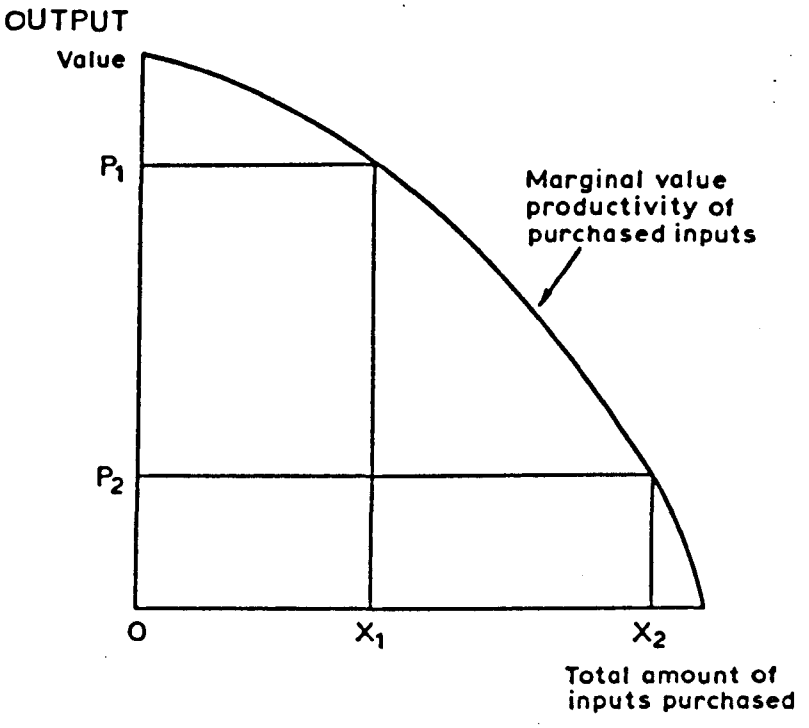
It is possible however that the same farmer could profitably use X_2 amount of fertiliser were sufficient capital available, or allow a poorer household to move from 0 to X_1 on the horizontal axis. In either case it is hypothesised that up to the point of diminishing marginal returns, extra capital could enable increased use of fertiliser and as a consequence, output and incomes to rise significantly. This could lead to a change in a farmer's asset position from E, as shown in Figure 7.2(a), typical of a traditional farmer in Northeast Thailand, to D typical of a commercialised farmer in the Central Plain (Thisyamondol et al., 1965).

In the case of larger-scale investments such as the purchase of farm machinery, land development or investment in a new enterprise, the effect of a medium- or long-term loan

would be to allow a farmer to make the investment without drawing excessively on his or her own liquidity reserves. If the investment is successful, a farmer could theoretically raise farm income over time by more than enough to repay the loan plus interest and still make a profit. If the investment fails, the increase would be insufficient and the borrower's financial position would deteriorate as shown in Figure 7.2(b) (Thisyamondol et al., 1965).

Aside from the effects of loans in allowing households to tolerate higher levels of risk, encouraging farm investment and drawing down of savings to help purchase optimal amounts of productive inputs (Adams, 1977; Tewari and Sharma, 1978), formal loans may also influence a household's ability to save. By relaxing liquidity constraints, loans may enable the stabilisation of consumption patterns, which has implications for how much a household is willing or able to save or invest (Adams, 1977, 1978; Reynolds, 1974). Formal financial intermediation can help potential savers and borrowers by adjusting to the seasonal liquidity deficits and surpluses through making it possible to spend in advance of income receipts, and by holding funds safely and profitably for future use (Lee, 1983; Meyer and Alisbuscan, 1984).

Fig. 7.1 A farm-household's marginal value productivity schedule



Source : Adams (1977), p.11

Fig. 7.2A Graph to show seasonal net liquid asset position typical of farmers in the Central Plain and Northeastern Region

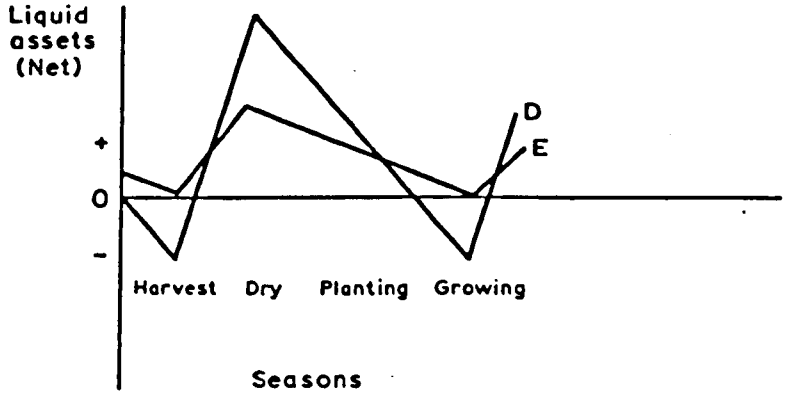
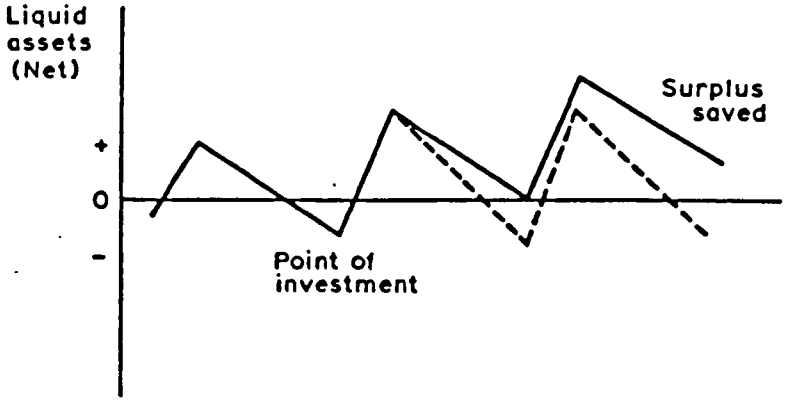


Fig. 7.2B Graph to show the effect of a long-term investment loan on farmers' net liquid position



Source: Thisyamondol et al (1965), p.8 and p.11

7.3 Measurement Problems

Despite the large number of farm-level impact studies carried out over the last decade (see section 2.6), few have gone beyond the farm component of the household economy or the purely descriptive analysis of changes in output levels, the use of inputs and the adoption of new technology among borrowers compared to non-borrowers, or for borrowers before and after joining a project. Even in the comprehensive AID Spring Review of Small Farmer Credit (1973) which comprised about sixty papers describing various country programmes, no paper "systematically assessed the farm-level impact of loans" (David and Meyer, 1979, p.7)

An important reason for this omission is that isolating the effects of loans from the effects of other changes in the farmer's institutional and agronomic environment is extremely difficult. According to Von Pischke et. al. (1983)

> "In the emerging view, evaluating credit projects by estimating their impact on what happens on the farm is generally an impossible exercise" (pp.7, Von Pischke et. al., 1983).

There are broadly two classes of problem: a) that of the "fungibility" of loans and b) that of "attribution":

7.3.1 Fungibility and attribution

The concept of "fungibility" refers to the fact that loans are only one of several sources of household liquidity. Adams (1977) depicts the farm-household economy as a tank with pipes leading from it, each representing a particular use of funds, ranked in order of priority; for example food, clothing, shelter and farm expenditure. Into the tank go liquid assets from a number of sources, income from crop production, non- and off-farm income, rentals and loans. The liquidity reserves are drained away as they are allocated to the household's most immediate needs at particular times of the year. In Adams' words,

> "rational households allocate their additional liquidity to those farm investments, non-farm investments, consumer durables or outright consumption which promise the most satisfaction" (Adams, 1977, p.14).

This feature of loans makes it very difficult to isolate the effects of loans on farm production, for which they are ostensibly intended, and in the household which may benefit directly or indirectly in a welfare sense (David and Meyer, 1979). The "attribution" problem refers to the difficulty of isolating the effects of loans from the effects of other factors affecting output levels, including soil conditions, access to irrigation, inputs, extension, farmers' managerial skills, marketing problems and price changes (David and Meyer, 1979).

Despite these difficulties, given the continued popularity of rural credit programmes as instruments of development policy, there is still a need for formal lenders to continue working towards a greater understanding of the results of loans. Various methodologies have been used to assess and quantify the farm-level effects of rural credit programmes. Some of these studies are summarised in Table 7.1, based on a typology proposed by David and Meyer (1979) which incorporates the principal characteristics and selected examples of the use of each approach. The details of each of the studies mentioned are given in sections 2.6.1 to 2.6.3.

The "descriptive" approaches depend on a relatively straight-forward comparison between selected groups of farmers or between the same farmers at different points in time, with respect to various measures of farming practice, productivity and income. The "econometric" methods are all based on the regression model, the main differences being in the role assigned to the "credit" variable. Where credit is analysed as part of a production function, it is treated as a variable in its own right and is assumed to have a linear "causal" or explanatory relationship with income, the dependent variable. Input demand functions treat credit as an independent variable, but focus on its effects on demand for individual farm inputs such as hired labour or fertiliser. Efficiency gap functions relate loans not to the production function, but to farmers' ability to allocate their resources efficiently.

7.3.3 Methodological characteristics

The fact that no clear picture on the farm-level effects of institutional loans emerges from a review of empirical findings is mainly due to differences in the research and

statistical methodologies employed and to the varying agro-economic conditions in different countries. However it is also a reflection of the technical characteristics of the various methods employed and problems caused by fungibility and attribution discussed above.

These technical short-comings are due, at least in part, to the manner in which the credit variable is specified. The main problems, summarised in Table 7.1 are:

1. Specifying credit as a separate input in a production function may lead to "double counting" because credit does not directly generate output; it simply provides extra liquidity to help the farmer purchase inputs.

2. There is no reason to expect a shift in the production function to be dependent upon borrowing. As indicated by the descriptive studies, this may or may not occur even if farmers make correct use of loans (David and Meyer, 1979).

3. Most production function studies do not take farmers' own savings into account in modelling the effects of institutional loans, despite evidence to suggest that from a financial perspective, savings[1] may occur before consumption rather than being left over (Von Pischke et al., 1983).

4. While the attribution problem limits the effectiveness of all approaches to varying degrees, the question remains as to how much of the observed difference in the production function between borrowers and non-borrowers is attributable to credit, and how much to other uncontrollable factors.

5. The main weakness of the input demand function used by Schulter (1974) and David et al. (1979), is that it does not directly test the impact of credit on production and income. The assumption of independence among the explanatory variables may also be unrealistic given the nature of socio-economic survey data.

6. The efficiency gap models are described by David and Meyer (1979) as the most "conceptually appealing" of the econometric approaches (Mandac and Herdt, 1978; Chung and Tamin, 1971). The main short-coming of this technique is that other influential factors such as the farmers' initial liquidity reserves, managerial ability and perception of risk are not usually taken into account in explaining differences in allocative efficiency. Also in order to measure allocative efficiency as accurately as possible, the technique requires the use of "experimental" data to establish a "frontier production function" against which to measure the performance of other farmers. In most cases this type of data is not available and the production function of the most successful farmers is used as the yardstick (David and Meyer, 1979).

7. Most studies do not attempt to analyse the role of credit beyond the farm, i.e in terms of its effects and relationships with other sources of income available to the farm-household.

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1. Or the setting aside of working capital.

Table 7.1: Empirical Studies of the Farm-Level Effects of Credit: Methods and Technical Short-Comings

METHOD	EXAMPLE	OBJECTIVE	SHORT-COMINGS
Descriptive			
a) "Borrowers" compared to "non-borrowers"	Data collected by David and Meyer (1979) from selected studies in Brazil, Colombia, Philippines, Korea and Taiwan.	To measure differences in use of inputs, production levels and incomes between groups of borrowers and non-borrowers.	Overstate impact of borrowing. Attribution problem, diversion and substitution.
b) "Before and after"	"Status changes among BAAC clients, BAAC Annual Report (1979).	To measure changes in input use, production and incomes since registering/joining a project.	Based on farmer recall; attribution problem.
c) Investment "without" credit	World Bank study (1976).	To measure impact of credit programmes, taking "substitution" problem into account.	Based on farmer recall.
d) "Sampling and decomposition" technique.	Study by Daines (1975).	To decompose value of output between borrowers and non-borrowers into price, crop mix and crop area effects. Each factor estimated by controlling for the effects of others. Controls for farm-size and environmental factors.	Multicolinearity.

continued...

METHOD	EXAMPLE	OBJECTIVE	SHORT-COMINGS
Econometric			
a) Production functions	Colyer and Jimenez (1971)	To find which of a series of independent variables including credit best explain variations in gross crop income	Specifying credit as a separate input raises the possibility of double counting; attribution problem; shift in production function not necessarily conditional upon short-term borrowing; attribution problem.
b) Input demand (ID) function	Schulter (1974)	To investigate the impact of credit and uncertainty on resource allocation. ID functions computed for a range of variables including labour, HYVs, fertiliser, machinery. Explanatory variables include financial constraint, farm-size and technical knowledge.	Does not directly test impact of credit on farm production and income.
	David et. al (1974)	To quantify the relative contribution of credit, prices and technology in explaining fertiliser demand in the Philippines 1977-80.	Multicollinearity.
c) Efficiency gap function	Mandac and Herdt (1978)	To measure the effects of credit on farmers' ability to allocate resources efficiently.	Requires experimental data to establish a "frontier" production function.
	Chung and Tamin (1971)	To measure farmers' response to increased capital availability and its effects on "allocative efficiency".	Differences in savings, managerial ability and effects on perception of risk not considered; attribution problem.

8. Little attempt has been made to analyse variations in either the need for, or effectiveness in the use of credit between farmers at different economic levels. This is a surprising short-coming given the common claim that credit programmes are intended to help small-scale farmers in particular.

To summarise, the analysis of the farm-level effects of credit has attracted considerable interest, resulting in a number of useful and interesting insights and raising a number of questions. However it is clear that no one analytical technique is entirely satisfactory from a methodological point of view. As Lipton has pointed out:.ls1

> "Seekers after neat "academic analysis" with clear conclusions as valid for credit in Madagascar as in Mongolia (Or Mars ?) will be disappointed", (Lipton in Padmanabhan (1988), forward, p. vii).

In view of the need for information about the actual or potential effects of credit for different scales of farming operation, perhaps a more important priority than trying to measure the direct impact of loans on production and incomes per se, is to work toward a greater knowledge of the economic structure of different types of farm-household and farmers' use of and need for additional liquidity from various sources. The results of such analyses could help improve the design of future rural credit programmes by taking into account the liquidity needs and the likely utilisation of credit among farmers with varying levels of resources at their disposal.

Bearing in mind the above constraints, the following section goes on to develop and test a model, using the farm-household survey data from Chainat province (see Section 6.5), to help illustrate the role and effectiveness of short-term production loans within the farm-household economy for different groups of farms operating under irrigated and rainfed conditions. The technique of path analysis is used to decompose the complex set of inter-relationships between variables representing the household economy in order to assess the role of credit in influencing production and incomes. Variations in managerial skill levels and marketing opportunities are taken as exogenous to the models and remain unanalysed. Farm-size is used as a proxy variable for measuring economic status. It is termed the "credit-only" model in order to distinguish it from the two other types of credit instrument examined in this study.

7.4 The "Credit Only" Model

7.4.1 Introduction

The problems of "fungibility" and "attribution" discussed above have restricted the attempts which have been made to measure the effects of credit on production and income. Indeed it may be unrealistic to suppose that the effects of credit can be measured at all in the sense of attributing some number of units of incremental production to each additional unit of credit available to the farmer. At the same time, qualitative evaluations and impressions are equally unsatisfactory since it is impossible to say how representative are the observations on which qualitative statements are based. In addition to good qualitative observations in the field is the need to develop a framework within which to examine the role and effectiveness of production credit within the farm-household, not only on the farm. The analysis should acknowledge the heterogeneity of decision-making units and take into account the relationships between a number of variables likely to be associated with sources of liquidity, expenditures, production and income.

7.4.2 Path analysis

The technique of path analysis, was developed by Sewell Wright in 1918. Based on multiple regression, it is a statistical technique not for discovering causes as such, but for testing the validity of a particular "causal" model formulated on the basis of a priori knowledge and theoretical considerations, represented in a set of recursive equations, expressed in the form of a structural equation model (Kerlinger and Pedhauzer, 1973; Breen, 1983). The aim of path analysis is to distinguish the parts of the relationship believed to be "causal" from the parts which are spurious or irrelevant. The analysis indicates whether or not the relations within the data set are consistent with the theoretical formulation or not. A good "fit" does not mean the theory is necessarily proven true, but simply lends support to the theoretical configuration of the model (Cook and Campbell, 1979). Although the specification and estimation of structural equation models is a technique well known to economists, the technique of path analysis, though useful is less familiar (Breen, 1983). The

discussion of path analysis given below and the application to the survey data later in the chapter is simplified and non-technical. A fuller account of the mathematical aspects of the technique is given by Heise (1975); Kerlinger and Pedhauzer (1973); Duncan (1966, 1975); Macdonald (1977), Bartholemew (1981); Cook and Campbell (1979); Pedhauzer (1982).

Path analysis is a variant of the multiple regression technique that is most powerful within an explanatory research framework; that is where the emphasis is on a) explaining the variability of a dependent variable using information from one or more independent variables; and b) formulating and testing explanatory models. The choice of independent variables is based on the theoretical formulations of the researcher and the relative strength of each independent variable is an important consideration. In applying the technique, the usual assumptions of regression analysis are adhered to (Kerlinger and Pedhauzer, 1973, p.309). These are:

a) The relationships between the variables are linear, additive and causal. Curvilinear, multiplicative and interaction relationships are excluded.

b) The residuals are not correlated among themselves nor are they correlated with the variables in the system. The implication of this is that all relevant variables are included in the system (plus a residual). Exogenous variables are treated as "givens" and remain unanalysed[1].

c) There is a one-way causal and "temporal" flow in the system; therefore reciprocal causation is ruled out.

d) The variables are measured on at least an interval scale

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1. An important assumption and requirement of multiple regression analysis is that the independent variables are not correlated among themselves. This is a condition recognised as notoriously difficult to fulfill in non-experimental research designs (Kerlinger and Pedhauzer, 1973; Bartholemew, 1981; Pedhauzer, 1982). Where independent variables are correlated, the order in which they are entered into the analysis has an effect on the proportion of variance accounted for and attributed to each of them. Within the framework of a causal model or path diagram, the ordering of the independent variables is not arbitrary. It is determined by the theoretical considerations that generated the specific model.

Advantages of path analysis

The advantages of the technique over standard regression analysis in the study of inter-relationships between variables may be summarised as follows:

a) The technique requires the specification of the inter-variable relationship in the form of a model, which must be justified by a theory or set of assumptions about the way in which the variables are inter-related;

b) it enables identification of the variables within the model which have the strongest "causal" influence on the dependent variables; and

c) allows for an assessment of the way in which a causal relationship is brought about and the magnitude and relative importance of the different component effects (Breen, 1983);

d) the method allows for testing of statistical relationships within models representing whole samples, and for sub-sets of the same sample and for comparisons to be made between them (Kerlinger and Pedhauzer, 1973).

Uses of path analysis

During the 1970s techniques for causal inference from non-experimental data including causal models, path analysis and structural equation models emerged as dominant within the fields of sociology and political science. While path analysis has been widely used in sociological and social science research (Cook and Campbell, 1979), its application within economics has been rather limited. However, as Breen (1983) has pointed out, its applications are considerable, especially when the aim is to discover not only with the factors which promote or retard agricultural development, but also to find out the relative importance of each explanatory factor. Murray (1977) used the technique in a study of rural modernisation in Thailand in order to measure the strength of various exogenous and endogenous influences on farmers' willingness to innovate. It has also been used in rural migration studies to "explain" the propensity to move, the short-term effects of circulation and the destination choices of villagers (Fuller et al., 1983; Bach and Smith, 1977; Parnwell, 1986).

An application of particular relevance to this study is that of Breen's (1983) reworking of Scully's 1962 analysis of the relationship between family size and farm performance among a sample of 38 farmers in Tipperary, Ireland. The starting point for this

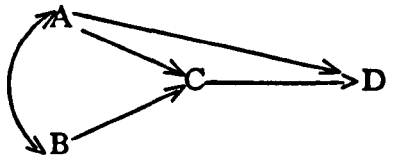
exercise was a set of multiple regressions with gross output per acre and farm income as the dependent variables, used to demonstrate that the size of the family was "an important incentive to greater efficiency of production within the farm" (Scully 1962, p.117). Breen (1983) used path analysis to take the analysis one stage further to examine the relative importance of other independent variables, including livestock density and farm-size, in explaining change in the dependent variables. The data were recast in the form of a set of recursive equations representing a specific theory as to the inter-relationships between the variables. Path analysis was then applied to the models depicting gross output and income per acre to decompose the various relationships into their direct causal effects, indirect causal effects, spurious components and unanalysed effects. The total causal effect, as the sum of the direct and indirect effects was then compared with the zero-order correlation between each pair of variables. The results showed that family size was important as a determinant of gross output and income per unit area, but rather less so than other variables in the model and assigned a relative importance to each of these (Breen, 1983).

Suitability of path analysis for this study

Credit is one of a complex of variables influencing farm-household cash-flow. The objective of this analysis is to assess the relative importance of different variables including production loans as determinants of input expenditure for irrigated and rainfed farms. By enabling the decomposition of the statistical relationships in order to distinguish the direct and indirect causal relationships from the spurious and irrelevant, path analysis meets this need. The method is also suitable for assessing the inter-relationships between variables for sub-sets of a larger sample, in this case by farm-size category, and for comparisons to be made between them. Overall, the method will allow for an assessment to be made of the extent to which the assumption of a direct causal relationship between credit, expenditure on inputs and income, the principle upon which rural credit programmes operate, is realistic under farm-level conditions.

7.4.3 The method

In simple terms, the technique of path analysis is best illustrated diagrammatically as shown below:



The principal dependent variable, D, is hypothesised as directly dependent on two independent variables A and C. However C is itself treated in part of the analysis as a dependent variable, directly dependent on A and B. This formulation allows for the identification of indirect statistical links between pairs of variables, in this case from both A and B through the intermediate variable C. In path analysis the researcher tests for each of these hypothesised relationships using standardised regression coefficients (beta coefficients). The resulting coefficients are used not only to confirm or refute the hypothesised links but also to measure the relative strengths of different statistical relationships. Thus for example the relative importance of A and B as influences on C may be assessed; and in certain circumstances the strength of a particular relationship may be compared for sub-sets of the whole sample, as in this chapter. In the above example A and B are considered to be "exogenous" variables, not determined by other variables within the model; exogenous variables are conventionally linked by double headed arrows, together with the zero-order correlation coefficient, to avoid any implication of "causality".

The significance level of each path coefficient is statistically verified on the basis of F-ratios, and some researchers use this as the criterion for including or deleting paths within the computed model. Depending on the sample size however, this could result in very weak paths being retained or alternatively the deletion of paths which may be theoretically important. Kerlinger and Pedhauzer (1973) suggest that the decision on whether or not to retain a path should be based on the researcher's a priori knowledge of the situation to which the model refers, and whether or not it is possible to derive a more parsimonious, but statistically valid model by the deletion of a path. As a rule-of-thumb Kerlinger and Pedhauzer (1973) suggest

that paths should be included in the model where the path coefficient is greater than + or -.05. Other methods for testing the significance of path models include the "testing of over-identified models[1]" explained in Pedhauzer (1982).

Statistical verification

The computed model may be statistically verified by using the path coefficients to reconstruct the zero-order correlation coefficients (r-values) through a system of recursive equations, one for each relevant pair of variables. The zero-order correlation coefficients are decomposed into their "direct", "indirect", "joint" and "co-ordinated error" effects[2], an exercise from which "powerful causal inferences may legitimately be drawn" (Davidson, 1977, pp. 805). If the model is correctly specified, the sum of these four effects will equal the original r-value for each bi-variate relationship, with a tolerance of 0.05 (Kerlinger and Pedhauzer, 1973). If on the other hand, the sum of the various effects does not approximate the r-value for each path, in other words if there are large co-ordinated error effects, it is

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1. A model which consists of more equations than are necessary for the purposes of parameter estimation (Kerlinger and Pedhauzer, 1973).

2. Definition and calculation of "causal effects" (Davidson, 1977, pp. 808).

(1) Direct effect: This is the path coefficient between two variables X and Y, and may be set equal to zero where a path has been omited on theoretical grounds. Where a variable is dependent on a single independent or exogenous variable, the path coefficient will be equal to the zero-order correlation coefficient.

(2) Indirect effect: Equal to the sum of all relevant paths from X to Y through other variables. Each path is the product of the path coefficents along it. A link between two variables may be included in any number of paths so long as each path is a unique path from X to Y.

(3) Joint effect: Equal to the sum of the effects of all variables not subsequent to X in the "causal" system which themselves affect Y. Joint effects measure the extent to which X works in conjunction with other exogenous variables in the system.

(4) Coordinated error terms: Equal to the sum of effects created by missing links in the model. Normally this effect arises from the operation of some as yet unmeasured cause, but may appear because too few or the wrong links have been specified.

likely that the model has been under-identified[1] and the theoretical assumptions behind it should be reconsidered. According to Davidson (1977), the best models are those which have the highest values on the direct and indirect effects. Large joint effects suggest that the model has been incorrectly specified given the character of the data set, and some re-definition of the model is necessary.

7.4.4 The hypothesised model

As explained above, the assumed purpose of borrowing is to enable farmers to purchase more farm inputs than they would normally use without the benefits of a loan. In the case of short-term production loans, this is assumed to lead to an observable increase in expenditure on improved inputs, which should in turn lead to increased production and incomes.

Figure 7.3 presents a simple theoretical model depicting the role of short-term production loans within the farm-household economy. The model represents a single agricultural year and indicates hypothesised relationships between each pair of variables. "FARM-SIZE" in rai and "LABOUR" measured as the number of permanent family person-days available for farm work, are hypothesised as two of the three main independent variables in the model, exogenous to the system, and unaffected in the short run by other variables.

Savings or "CAPITAL RESERVES" at the beginning of the crop year is hypothesised as the third independent variable. Savings may be thought of as either a dependent or an independent variable depending on the point in time a model represents. According to Von Pischke et al. (1983)

> "The usual convention in economic analysis is to treat funds carried over from one period to the next as savings and economists fix the length of time to suit the purposes of their analysis. But in principle, any income not disbursed the instant it is received may be regarded as saved until such times as it is disbursed" (Von Pischke et al., p. 415).

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1. A model that contains insufficient information for the purposes of parameter estimation (Kerlinger and Pedhauzer, 1973).

Alternatively savings may take place before consumption which is adjusted in relation to liquidity reserves and expected additional inputs from loans and other sources of income (Von Pischke, 1983). For the purposes of this model, "CAPITAL RESERVES" at the beginning of the year are defined as the surplus left over from the previous production season when all farm and consumption expenditures have been met.

An important assumption underlying the model is that farmers plan their production expenditures in relation to cash reserves at the beginning of the year and the likelihood of obtaining credit[1]. In other words, farmers seek loans to provide the additional liquidity necessary to cover expected deficits due to farm and household expenses incurred during the year. In the hypothesised model "LOANS", that is the amount of short-term production credit borrowed from formal and informal sources[2], is therefore hypothesised as having a negative relationship with "CAPITAL RESERVES" and with additional income earned from "OFF-FARM" sources such as agricultural and non-agricultural labouring, farm machinery, land rentals and trade. The amount of capital obtained as loans is also hypothesised to vary positively with "FARM-SIZE", since production costs increase in relation to farm-size.

On the assumption that farmers seek off-farm income to supplement working capital balances at the beginning of the year, earnings from "OFF-FARM" sources is in turn hypothesised to be a function of the level of "CAPITAL RESERVES", and the amount of family "LABOUR" available to earn income from such activities. Since hired labour costs make up a substantial proportion of production costs, the amount borrowed is hypothesised to vary negatively with the availability of family labour. The more family labour to do farm work, the less the need to borrow to pay hired labour.

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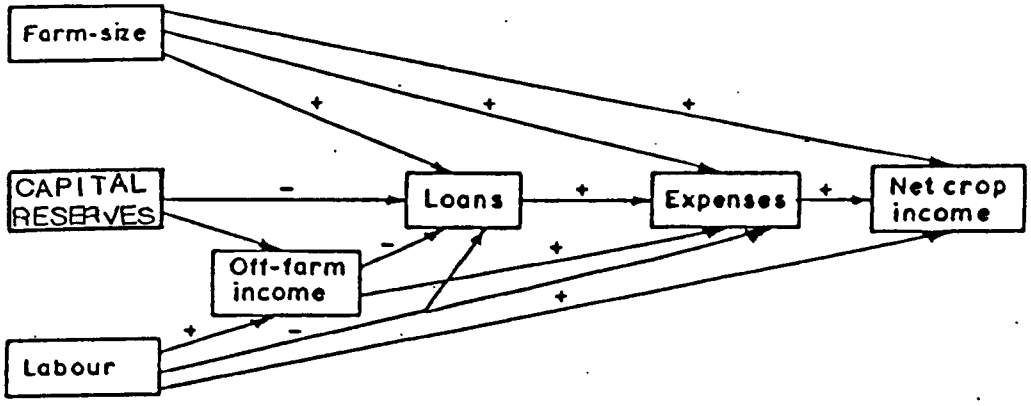
1. Normally, BAAC loan officers take cash surplus from the previous year's crop into account when fixing loan amounts.

2. All loans taken for productive purposes by the sampled farmers were included in the analysis. Those taken explicitly for consumption purposes were excluded.

Fig. 7.3 Hypothesised role of short-term credit within the household economy



The amount of capital a farmer spends on productivity-increasing inputs depends in part upon the size of the farm, but perhaps more importantly, on the availability of capital. Expenditure on farm inputs "EXPENSES", one of the two main dependent variables in the model, is hypothesised as dependent on the area planted "FARM-SIZE", the amount of liquidity provided by production "LOANS" and "OFF-FARM income and the availability of family "LABOUR" to substitute for hired labour.

"NET CROP INCOME", the second dependent variable of interest, is hypothesised to be a function of three variables - "FARM-SIZE", the amount of family "LABOUR" available and cash expenditure, ("EXPENSES"), on inputs such as fertiliser, insecticide, hired labour for farm work and farm machinery.

Although the outcome of investments in farm inputs may be less than anticipated due to uncontrollable factors such as floods, droughts, price changes and marketing problems, one would nevertheless expect to find a strong positive relationship between the amount borrowed for production purposes ("LOANS") and actual expenditure ("EXPENSES") on farm inputs during the year. Given that the main objective of institutional credit programmes is to increase crop incomes by enabling farmers to purchase greater amounts of productivity-increasing inputs, this relationship is of special interest in this study.

The model presented in Figure 7.3 is tested for both the whole sample and disaggregated for small-, medium- and large-scale farming operations using data from the household survey conducted in Nang Lue and Nong Noi (see section 6.5). The method used to verify the model, that of reconstructing the zero-order correlation coefficients, is demonstrated for Figure 7.4. The overall results of the separate analyses for each farm-size category are shown in Tables A1.1 and A1.2 in Annex 1.

7.5 Testing the Hypothesised Model

7.5.1 Whole sample: Nang Lue (Figure 7.4)

Taking the sample as a whole for tambon Nang Lue, the computed model is broadly consistent with that hypothesised and the "co-ordinated error" effects for individual paths are

within the acceptable limits to verify the model (Table A.1, Annex 1). The directions of some relationships however turned out to be the opposite of those hypothesised.

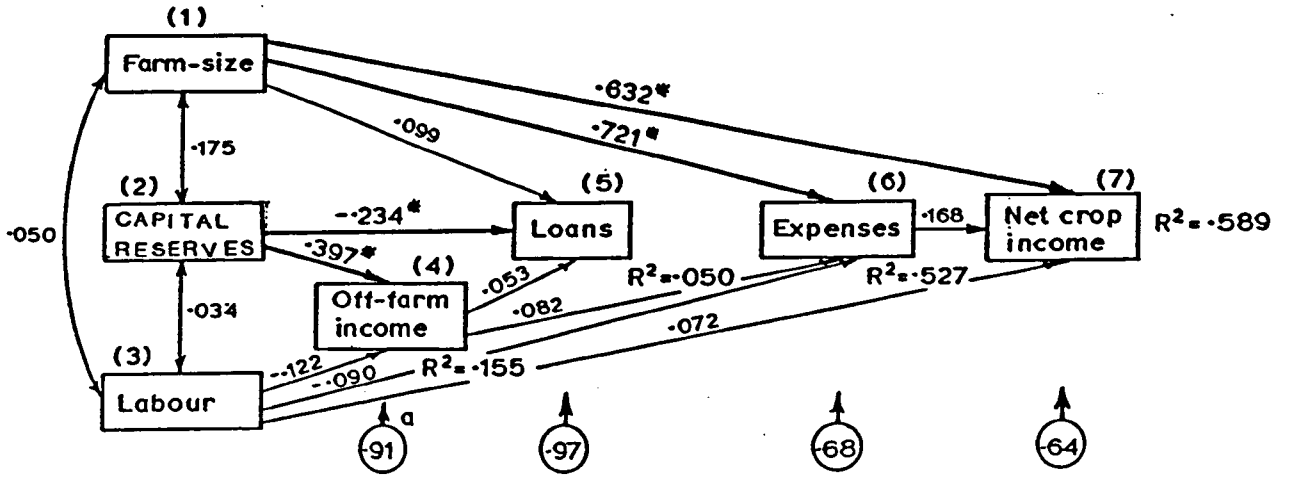
For example, a positive relationship was expected between the availability of family LABOUR and OFF-FARM income on the assumption that the more labour available within the household, the greater the possibilities for accumulating income from non- and off-farm sources. The computed negative path between these variables (p_{43}=-.122) suggests an alternative explanation. Since rice agriculture is highly productive in this area and, under ideal irrigation conditions provides year-round on-farm employment, farmers may consider it more remunerative to invest most of their labour resources in the farm rather that divert some family labour to earn cash elsewhere. The positive and statistically significant relationship between CAPITAL RESERVES and OFF-FARM income (p_{42}=.379) suggests that off-farm income may be an important determinant of the level of working capital available to this group of farmers. The significance of this relationship and the negative and statistically significant path between CAPITAL RESERVES and LOANS (p_{52}=-.234) provides some explanation for the tenuous link between OFF-FARM INCOME and LOANS. In this model, the level of working CAPITAL RESERVES at the beginning of the year has an over-riding influence on the amount borrowed both in a direct way and through its "joint effects" with other variables. The results in Table A1.1 (Annex 1) show that the joint effect of CAPITAL RESERVES with OFF-FARM income and LOANS ($p_{52}r_{24}$=-.088) is of marginally greater importance in controlling for amounts borrowed, than the direct effect of OFF-FARM income (p54=.053). However both relationships fail to reach statistical significance. The relative strength of the path coefficient between CAPITAL RESERVES and LOANS (p_{52}=-.234) compared with that between FARM-SIZE and LOANS (p_{51}=.099) provides evidence for the original hypothesis that farmers borrow in relation to their level of liquidity reserves at the beginning of the crop year.

In view of the level of formal and informal borrowing in this area during the crop year in question (see Table 6.6) and the highly productive nature of rice agriculture, the absence of a relationship between the value of production LOANS and expenditure on inputs

(EXPENSES) is surprising and contrary to expectations. This result adds weight to the hypothesis made in Chapter VI of a weak association between the amount of credit borrowed for production purposes and expenditure on inputs. As expected, FARM-SIZE has by far the strongest direct effect on input expenditure (p_{61}=.721), while the relationship between LABOUR availability and input EXPENSES is negative, as hypothesised, though weak (p_{63}=-.090), as is the direct effect of OFF-FARM income (p_{64}=.082). Taken together, the three independent variables "explain" 53 per cent of the variation in input expenditure in Nang Lue (R^2=.527).

The model is also relatively successful in accounting for variation in NET CROP INCOME (R^2=.589). Of the hypothesised independent variables, FARM-SIZE has the strongest direct effect on NET CROP INCOME (p_{71}=.632), confirming the obvious point that larger farmers have higher production levels and derive the highest incomes from crop production. The effects of LABOUR availability on NET CROP INCOME is weak (p_{73}=.072) as is the effect of input EXPENSES (p_{76}=.168). The assumed "causal" relationships between LOANS, EXPENSES and NET CROP income were not present for the sample as a whole in Nang Lue.

Fig. 7.4 Whole sample Nang Lue (n = 112)



(a) Residual path coefficient for each dependent variable = $\sqrt{1-R^2}$

* Statistically significant

Model Verification

Path	Path Components	Substitution	Reconstructed r	Original r
$p_{12}=0$		-	-	.175
$p_{23}=0$		-	-	.034
$p_{43}=p_{43}+p_{32}r_{24}$		-.122+(.034x.375)	-.109	-.109
$p_{42}=p_{42}+p_{43}r_{23}$		.379+(-.122x.034)	.375	.375
$p_{52}=p_{52}+p_{51}r_{12}+p_{54}r_{24}$		-.234+(.099x.175)+(.053x.375)	-.196	-.196
$p_{51}=p_{51}+p_{52}r_{12}+p_{54}r_{14}$		.099+(-.234x.175)+(.053x-.004)	.058	.058
$p_{61}=p_{61}+p_{64}r_{14}+p_{65}r_{15}+p_{63}r_{13}$		.721+(.082x-.004)+(-.023x.058)+(-.090x.050)	.714	.714
$p_{76}=p_{76}+p_{71}r_{16}+p_{73}r_{36}$		.168+(.632x.714)+(.072x-.061)	.615	.615
$p_{71}=p_{71}+p_{76}r_{16}+p_{73}r_{13}$		.632+(.168x.714)+(.072x.050)	.756	.756
$p_{65}=p_{65}+p_{61}r_{15}+p_{64}r_{45}$		-.023+(.721x.058)+(.082x-.035)	.021	.021
$p_{63}=p_{63}+p_{64}r_{43}+p_{61}r_{13}+p_{65}r_{35}$		-.090+(.082x-.109)+(.721x.050)+(-.023x-.073)	-.064	-.061
$p_{64}=p_{64}+p_{61}r_{14}p_{65}r_{45}+p_{63}r_{34}$		.082+(.721x-.004)+(-.023x-.035)+(-.090x-.109)	.068	.089
$p_{54}=p_{54}+p_{52}r_{24}+p_{51}r_{14}$		.053+(-.234x.375)+(.099x-.004)	-.035	-.035
$p_{73}=p_{73}+p_{71}r_{13}+p_{76}r_{36}$		.072+(.632x.050x.050)+(.168x-.061)	.093	.093

7.5.2 Small-scale farms: Nang Lue (Figure 7.5)

Further patterns emerge when the sample is disaggregated into separate farm-size categories. As for the sample as a whole, there is a negative relationship between CAPITAL RESERVES and LOANS for small-scale farmers (p_{52}=-.143) which becomes stronger for successive farm-size categories: p_{52}=-.368 for medium-scale farmers and p_{52}=-.679 for large-scale farmers. These results bear out the hypothesis that the lower the level of working capital available, the greater the amount borrowed. For small-scale farmers however, FARM-SIZE is of relatively greater importance as a determinant of amounts borrowed (p_{51}=.381). OFF-FARM income is positively and significantly related to CAPITAL RESERVES for this group (p_{42}=.333) which suggests it is an important determinant of liquidity levels within the farm-household. Yet there is no direct relationship between OFF-FARM income and LOANS. Thus small-scale farmers in this area appear to take out loans for production irrespective of the amounts earned and saved from off-farm sources.

With regard to the funding of inputs, OFF-FARM income appears to be unimportant as a determining variable for this group. Contrary to findings for the sample as a whole, LOANS have a direct, though statistically non-significant effect on input EXPENSES (p_{65}=.163); however the joint effect with FARM-SIZE and input EXPENSES ($p_{51}r_{16}$=.217), and the direct effect of FARM-SIZE (p_{61}=.516), are of relatively greater importance as explanatory factors. The model, as specified "explains" 35 per cent of the variation in EXPENSES for this group (R^2=.354).

Finally, unlike for the sample as a whole, the computed model shows a direct and statistically significant relationship between input EXPENSES and NET CROP income, a relationship which is absent for the sample as a whole (p_{76}=.392). The direct effect of LABOUR availability on NET CROP INCOME is also statistically significant (p_{73}=.310), while the effect of FARM-SIZE is weak (p_{71}=.054). These results imply that small-scale farmers received good returns on their investments of both capital and labour resources during the year in question. Taken together the independent variables specified account for 28 per cent of the variation in net crop income (R^2=.282).

Fig. 7.5 Farm-size up to 20 rai (n = 46)

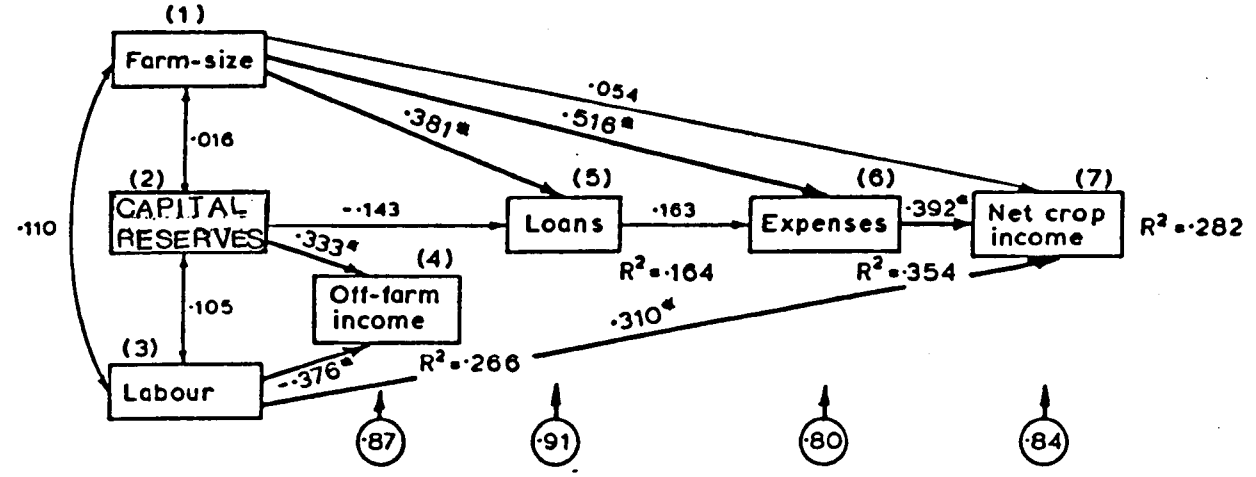


Fig. 7.6 Farm-size: 21 to 40 rai (n = 37)

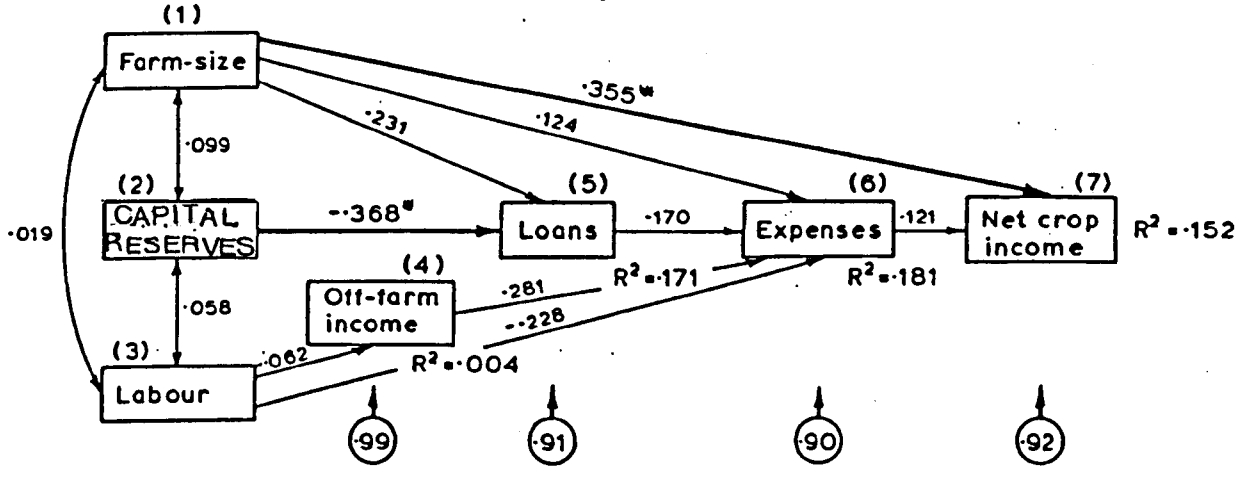
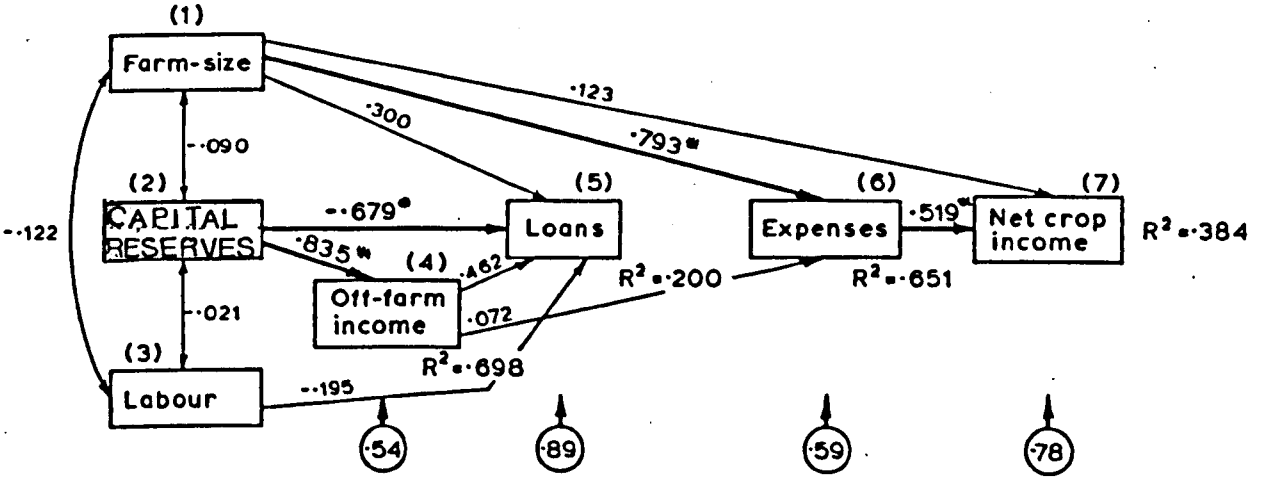


Fig. 7.7 Farm-size: 41 rai and over (n = 29)



7.5.3 Medium scale farms: Nang Lue (Figure 7.6)

Of the three independent variables hypothesised to control for LOANS, working CAPITAL RESERVES exerts the strongest direct effect (p_{52}=-.368) for this group, followed by FARM-SIZE (p_{51}=.231). As for the small-scale farmers, there is no relationship between production LOANS and OFF-FARM income and only a weak relationship between LABOUR availability and OFF-FARM income (p_{43}=-.062) which in turn is unrelated statistically to CAPITAL RESERVES. OFF-FARM income does however have a direct effect on input EXPENSES (p_{64}=.281) which is stronger than the direct effect of LOANS (p_{65}=.170) or FARM-SIZE (p_{61}=.124). Thus for medium-scale farmers, OFF-FARM income appears to be the strongest influence on input expenditure. This situation is different to that for the small-scale farmers in the same area (Figure 7.5) for whom LOANS have the greatest direct effect on EXPENSES. Input expenditure is negatively related to LABOUR availability (p_{63}=-.228) which is suggestive of the need of farmers within this group to hire additional labour. Table 6.8 shows that the cost of hiring labour is the main item of agricultural expenditure by value for medium-scale farmers in this area. The model "explains" 18 per cent of the variation in input expenditure (R2=.181), the main contributory factors being off-farm income and labour availability.

In spite of the higher level of expenditure on inputs compared to that of the small-scale farmers (see Table 6.6), the relationship between EXPENSES and NET CROP income is weaker for this group than for smaller-scale farmers and statistically non-significant (p_{76}=.121). The relationship between LABOUR availability and NET CROP INCOME noted for the small-scale farmers is also absent. One possible explanation is that the financial returns to labour diminish with increasing farm-size in this area[1] (see "gross margins", Table 6.6). There is a greater likelihood that medium-scale farmers use tractors, either their own or hired, to substitute, at least in part, for hired labour. FARM-SIZE is the most important

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1. Alternatively, this result could reflect the fact that the crop disease "khiew tia" caused serious losses in certain parts of this district in 1980/1.

controlling factor for this variable (p_{71}=.355).

7.5.4 Large-scale farms: Nang Lue (Figure 7.7)

The most striking features of the computed model for large-scale farmers shown in Figure 7.7 are:

a) the close relationship between CAPITAL RESERVES and OFF-FARM income (p_{42}=.835), with CAPITAL RESERVES making the greatest contribution to the R^2 value for this variable (R^2=.698);

b) the importance of CAPITAL RESERVES in controlling for LOANS both in a direct and in an indirect sense (p_{52}=-.679; $p_{54}r_{24}$=.359); and

c) the complete absence of a relationship between production LOANS and expenditure on inputs (EXPENSES).

These results, which mirror those for the sample as a whole, suggest that while farmers take out production loans in relation to liquidity reserves at the beginning of the year, the hypothesised relationship between LOANS and EXPENSES does not exist. Moreover, despite the importance of OFF-FARM income in relation to CAPITAL RESERVES, and as a controlling factor for LOANS, its effects on input expenditures both direct and indirect, are very weak (p_{64}=.072; $p_{61}r_{14}$=.055). Thus, contrary to expectations, there are no statistical relationships between LOANS and EXPENSES and OFF-FARM income and EXPENSES for this group. FARM-SIZE has by far the strongest direct effect on input expenditure (p_{61}=.793), and accounts for most of the 65 per cent variation "explained" by the computed model (R^2=.651). By contrast, FARM-SIZE is relatively unimportant in directly controlling for variation in NET CROP INCOME (p_{71}=.123). However its indirect effect on income via input EXPENSES ($p_{76}r_{16}$=.416) is relatively strong. Of the hypothesised independent variables, expenditure on farm inputs (EXPENSES) has the greatest direct effect on NET CROP INCOME (p_{76}=.516). This suggests that, as for their small-scale neighbours, regardless of the source of finance for farm inputs, the amount spent has a strong direct effect on the net value of output. The model "explains" 38 per cent of the variation in NET CROP INCOME (R^2=.384).

7.5.5 Whole sample: Nong Noi (Figure 7.8)

A basic hypothesis underlying this analysis is that the relative importance of production loans in affecting expenditure on inputs and net crop income varies, not only by farm-size category but also by the ecological conditions under which farmers operate. Figure 7.8 presents the computed model for the whole sample in the rainfed area of Nong Noi. As for the sample in Nang Lue, Table A1.2 (Annex 1), shows that the "coordinated error" effects for each bi-variate relationship for each farm-size category are within the limits acceptable to verify the model. However the direct, indirect and joint effects between the variables are generally weaker than in Nang Lue.

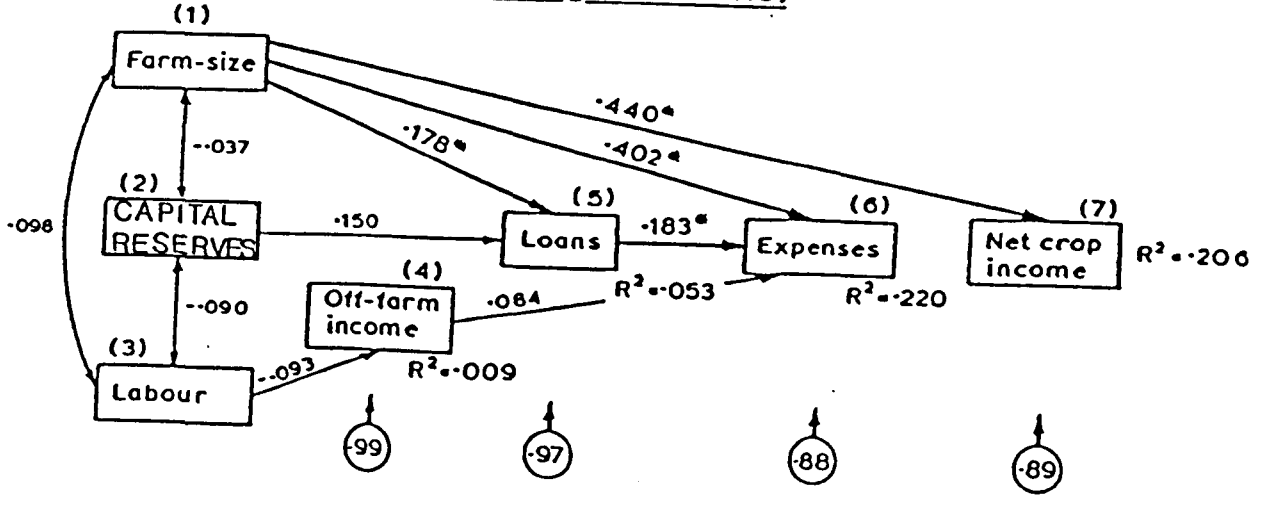
Contrary to findings for the sample as a whole and for each of the farm-size categories in Nang Lue, the relationship between LOANS and CAPITAL RESERVES is positive (p_{52}=.150) in Nong Noi, suggesting that farmers in this area borrow in order to supplement, rather than to substitute for their own liquidity reserves. The amount borrowed (LOANS) is unrelated statistically to earnings from OFF-FARM sources which is in turn unrelated to the level of CAPITAL RESERVES at the start of the year. FARM-SIZE is the strongest controlling factor on the amounts borrowed (p_{51}=.178). In total, the hypothesised independent variables account for only 5 per cent of the variation. This suggests that in this marginal, rainfed area, factors other than those hypothesised, such as lenders' assessment of a farmer's perceived diligence and "potential viability", are mainly responsible for the variation in amounts borrowed (see section 7.5.6).

An interesting and important feature of the model however, is the direct and statistically significant path between LOANS and EXPENSES (p_{65}=.183). There is no such relationship for the aggregate sample in Nang Lue. Although in Nong Noi FARM-SIZE has a stronger direct effect on borrowing (p_{61}=.402), the results suggest production loans are in general a more critical as a determinant of expenditure on inputs than in Nang Lue. The amount of family LABOUR and OFF-FARM income do not assist in explaining variations in input expenditure for this group (R^2=.220). Since input expenditure is unrelated statistically

to either CAPITAL RESERVES or LABOUR availability, and the R^2 value is very low (R^2=.009), OFF-FARM income may be thought of as a fourth exogenous in this particular model.

Although production LOANS are more closely associated with EXPENSES than in Nang Lue, the expected relationship between this variable and output, measured in terms of NET CROP income, is absent. This may be explained in part by the adverse environmental conditions in Nong Noi. Infertile soils and inadequate rainfall generally give rise to poor yields, and investments of capital and labour in production are often wasted. The model accounts for 20 per cent of the variation in NET CROP income (R^2=.206) compared to 59 per cent for the Nang Lue sample. FARM-SIZE has the most important effect on income both in a direct (p_{71}=.440) and in an indirect sense ($p_{71}r_{16}$=.185) via input expenditure.

Fig. 7.8 Whole sample Nong Noi (n = 115)



7.5.6 Small-scale farms: Nong Noi (Figure 7.9)

In many respects the computed model depicting the role of credit within the household economy of small-scale farmers in Nong Noi is quite different from that hypothesised. As for the sample as a whole, there is a positive statistical relationship between working CAPITAL RESERVES and LOANS (p_{52}=.298), which suggests that members of this group borrow funds to supplement rather than to substitute for their own working capital; and the more farmers earn from OFF-FARM sources, the more they borrow (p_{54}=.106). The relative strength of these relationships compared to that between LOANS and FARM-SIZE (p_{51}=.045) suggest that lenders may consider working CAPITAL RESERVES and the ability to generate off-farm income to be more reliable indicators of "credit-worthiness" for small-scale farmers than land availability in marginal areas, given the low and unstable incomes from crop production. On the other hand, the model explains less than 10 per cent of the variation in production LOANS (R^2=.098). As for the sample as a whole, factors outside the model, of a non-economic nature, have greater explanatory power with respect to borrowing. Variables other than FARM-SIZE and CAPITAL RESERVES may be taken into account in deciding a farmer's credit-worthiness, for example, a farmer's **potential** to generate sufficient marketable surplus to repay a loan after utilisation of the loan to purchase productivity increasing inputs, rather than before[1]. It is also relatively common for informal lenders to waive security requirements altogether depending on the relationship with the borrower and the interest rate he or she can charge.

The most noteworthy feature of Figure 7.9 however, is the strong and statistically significant relationship between LOANS and EXPENSES (p_{65}=.571). The path coefficient between these variables is stronger than for any other farm-size category in this area or in Nang Lue. The direct effects of FARM-SIZE (p_{61}=.105) and OFF-FARM income (p_{64}=.091) on EXPENSES are very weak in comparison. These results imply that in spite of

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1. This principle was adopted in the EC-funded Small Farmers' Recruitment and Servicing Project (see Chapters VIII and IX).

the relative poverty of this group, the farmers are more likely to use production loans to purchase inputs than their more financially-secure neighbours in Nong Noi and Nang Lue. This is an important and significant finding which goes against the view generally held by bankers that economically-marginal farmers are more likely to misuse production loans for farm investment due to the marginal nature of their household economies.

The relationship between input EXPENSES and NET CROP income is also relatively strong for this group (p_{76}=.340). Although the level of expenditure on inputs was lowest for this group in 1980/1 (see Table 6.6), its direct relationship with the net value of output was stronger than for the other two groups. FARM-SIZE is slightly more important than EXPENSES in "explaining" variations in NET CROP income (p_{71}=.358), while LABOUR availability makes no direct contribution to the R^2 value for this relationship (R^2=.280).

7.5.7 Medium-scale farms, Nong Noi (Figure 7.10)

For this group, the amount borrowed (LOANS) bears more relation to earnings from OFF-FARM sources (p_{54}=.168) than to FARM-SIZE (p_{51}=-.101) or to working CAPITAL RESERVES (p_{52}=.068). This suggests that medium-scale farmers use off-farm income as an alternative to loans as a source of funds to finance production. The amount borrowed and earnings from OFF-FARM sources have only a weak relationship with working CAPITAL RESERVES. Concerning expenditure on farm inputs, LOANS have the strongest direct effect (p_{65}=.340), followed by FARM-SIZE (p_{61}=.280), and both coefficients are statistically significant. The results suggest that LOANS have the strongest influence on input expenditure for this group supplemented by OFF-FARM income (p_{64}=.203). The model accounts for 25 per cent of the variation in input expenditures for this group (R^2=.250).

Fig. 7.9 Farm-size up to 30 rai (n = 28)

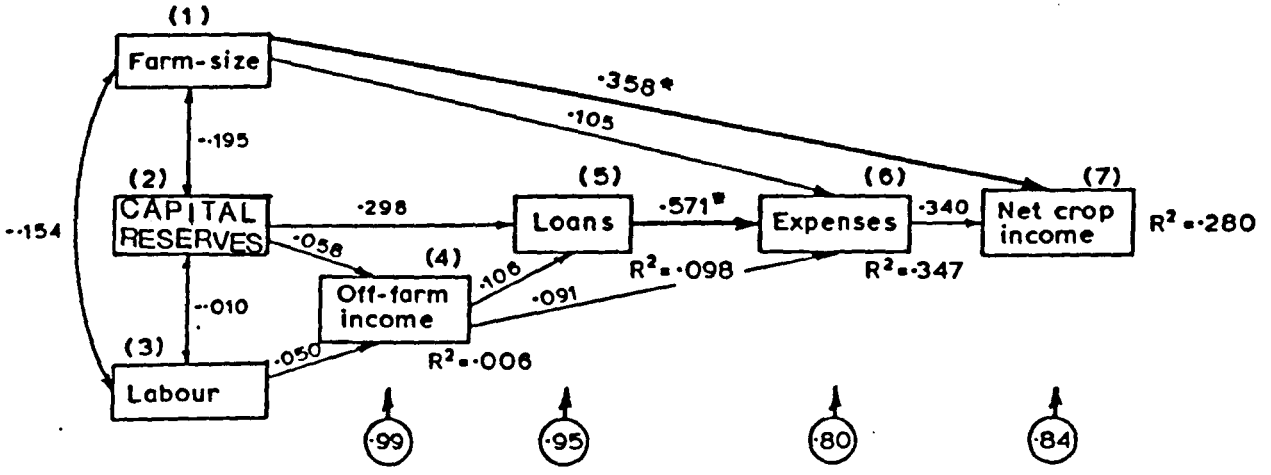


Fig. 7.10 Farm-size : 31 to 60 rai (n = 62)

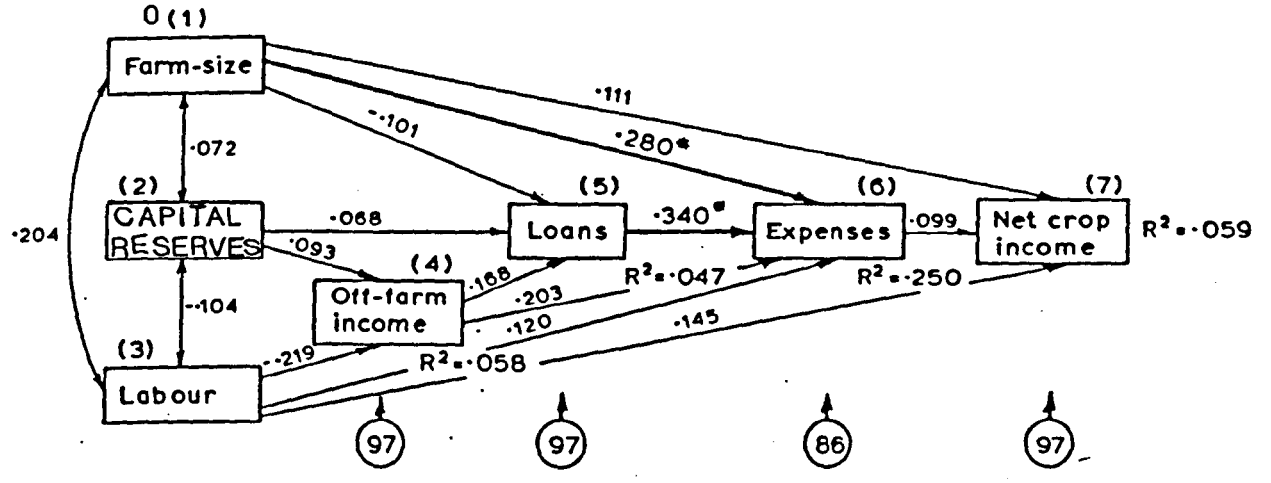
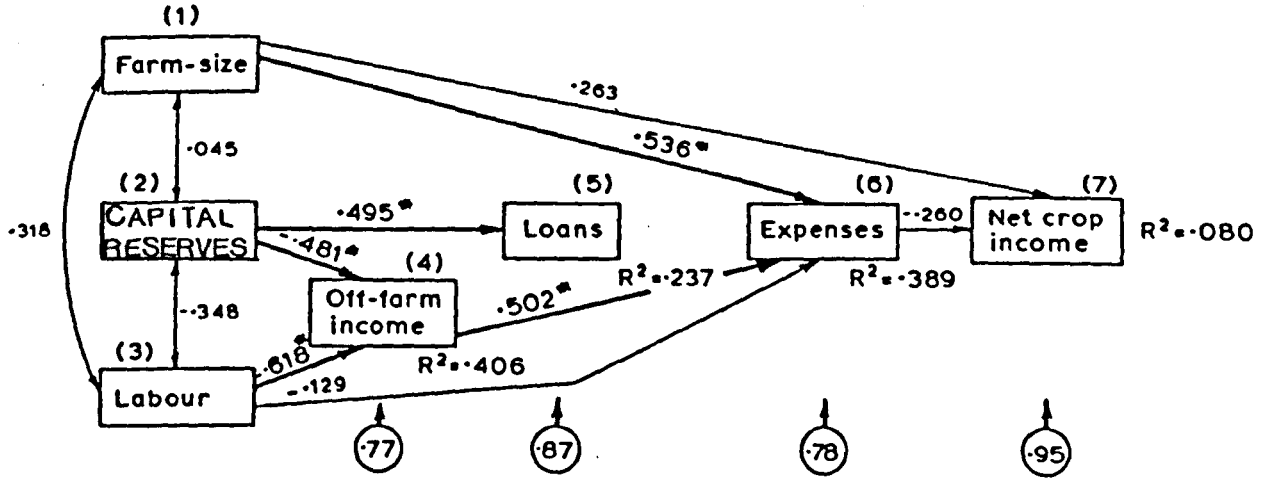


Fig. 7.11 Farm-size : 61 rai and over (n = 25)



Despite the significant relationship between LOANS and EXPENSES, the path between EXPENSES and NET CROP income is weak (p_{76}=.099). This may reflect the fact that some of the sampled farmers with fields in the lowland part of Nong Noi lost part of their crop as a result of flooding in the 1980/81 crop year. Alternatively the weak relationship may reflect uneconomic use of inputs such as chemical fertiliser where rice yields do not respond well to its use. Labour availability and farm-size are relatively more important than input expenditure as explanatory variables for NET CROP INCOME (p_{73}=.145; p_{71}=.111).

7.5.8 Large-scale farms: Nong Noi, (Figure 7.11)

Of the four variables hypothesised to control for the level of borrowing for this group, CAPITAL RESERVES is the only variable to attain statistical significance (p_{52}=.495). This relationship is positive and stronger than for the small- and medium-scale farmers in the area, however, contrary to expectations, there is no relationship between FARM-SIZE and LOANS. OFF-FARM income has a relatively strong and negatively dependent relationship with working CAPITAL RESERVES (p_{42}=-.481), which is determined largely by the amount of farm LABOUR available within the household (p_{43}=-.618). CAPITAL RESERVES and LABOUR availability "explain" over 40 per cent of the variation in OFF-FARM income (R^2=.406).

As for the large-scale farmers in Nang Lue, there is no statistical relationship between the value of short-term production LOANS and EXPENSES for this group. OFF-FARM appears to be the main source of liquidity associated with this variable (p_{64}=.502). In total, the model explains 39 per cent of the variation in EXPENSES (R^2=.389), with FARM-SIZE, OFF-FARM income, and the indirect effect of LABOUR availability ($p_{64}r_{34}$=-.225) as the main contributory factors. The negative relationship between EXPENSES and NET CROP income (p_{76}=-.260) may reflect losses caused by flooding in the lowland part of Watsing district during the 1980/1 season.

7.6 Summary and Conclusions

The results of the analyses presented in this chapter allow some useful generalisations to be made about the role and farm-level effects of production loans for small-, medium- and large-scale farmers operating under both irrigated and rainfed conditions.

In Nang Lue the agronomic conditions are ideally suited for rice production and over ninety per cent of the cultivated land is irrigated. The use of modern inputs is widespread, most farmers can grow two crops of rice per year depending on water availability, and incomes from crop production are relatively stable. The demand for production credit is high, and since repayment rates are generally satisfactory, formal lenders are satisfied that the assumed relationship between LOANS, EXPENSES and NET CROP incomes occurs. The results of this analysis however show that this relationship cannot always be demonstrated to exist, at least not for all groups of farmers.

Disaggregating the sample by farm-size category demonstrates a negative relationship between working capital reserves and borrowing in Nang Lue which becomes stronger for successive farm-size categories. This suggests, as hypothesised, that farmers borrow to finance production in relation to the level of liquidity reserves at the beginning of the year. However, the extent to which such loans are critical for purchasing inputs is in doubt since the relationship between the amount borrowed and expenditure on inputs is very weak for both small-and medium-scale farmers, and completely absent for large-scale farmers. For the small and medium groups, off-farm income is more influential than loans as a determinant of input expenditure, while for large-scale farmers the main source of finance is not clear from the model. Although most farmers require loans to cover liquidity deficits at different times of the year, these results raise the question of whether or not economically advantaged farmers in irrigated areas really need low-cost credit to finance production, when they can afford to rely on other sources of liquidity, especially off-farm income.

In Nong Noi by contrast, farmers have more restricted access to institutional credit due to the low productive potential of the area and the predominance of mono-cropping. Despite the smaller average size of loans, the amount borrowed is positively and significantly related to input expenditure for small- and medium-scale farmers in particular. Indeed the results imply that credit is most critical in financing inputs for small-scale farmers, is less important for medium-scale farmers and appear to be unnecessary for large-scale farmers who, like their counterparts in Nang Lue, appear to rely principally on off-farm income to finance production. A plausible reason for this finding is that small-scale farmers in Nong Noi have few productive assets apart from their own labour with which to generate working capital. They are therefore more dependent on the additional liquidity provided by loans, as a supplement to working capital reserves to finance farming which is their main source of income. Earnings from off-farm income may be used to fund family consumption expenditures. In the interests of maintaining a good repayment record and future access to loans, poorer farmers appear more likely to invest loans productively in order to generate sufficient marketable surplus for home consumption and to repay their loans. This is less likely to be the case among larger-scale farmers who do not rely solely on income from crop production in order to finance production and repay their debts. These results suggest that the potential of production loans to bring about increases in productivity and farm incomes is highest among small-scale farmers in rainfed area, who have few alternative sources of liquidity to finance production.

Given the extreme vagaries of the rainfall pattern however, and the limited resource endowments of small-scale farmers, particularly those in marginal areas such as tambon Nong Noi and in the Northeastern region, short-term loans to cover production inputs cannot in isolation be expected to bring about significant increases in productive capacity. The question arises as to the extent to which technical support could increase the chances of loans being used more productively among small-scale farmers. Few credit programmes throughout the world have attempted to link production credit with extension outside the

controlled project framework. Having tested the concept within the context of a pilot project in the Northeastern region from 1984-86, the BAAC attempted to provide a linked credit-extension service to small-scale farmers in the Northeastern region from 1987 to 1991, using grant assistance from the Commission of the European Communities (CEC). The results of this programme and the initial effects of the credit-extension model on farm productivity within the small farmer target group is examined in the following two chapters.

CHAPTER VIII

CASE STUDY 2 - THE SMALL FARMERS' RECRUITMENT AND SERVICING PROJECT, UBON PROVINCE

8.1 Objectives of the chapter

The objective of this chapter is to introduce the BAAC-DoAE Small Farmers' Recruitment and Servicing Project, which was designed to provide credit-extension packages to small-scale farmers within the EC grant-assisted Northeast Poor Farmers Scheme. The chapter includes an introductory section describing the Northeast Poor Farmers' Scheme, its components, rationale and objectives, and thereafter focuses on the Small Farmers' Recruitment and Servicing Project (Sub-Project 1) in Ubon Ratchathani (Ubon) during the period 1987-1990 in order to illustrate the various difficulties involved in implementing this type of approach. Chapter IX proceeds to use data from a small survey carried out in Ubon province in February 1990 firstly to describe the general agro-economic characteristics of the project farmers and then to develop and test a simplified model to explore the statistical relationships between credit, extension support and productivity at the farm level for the 1989/90 crop year.

8.2 Background to the Northeast Poor Farmers' Scheme

From 1984-87 the Commission of the European Communities (CEC) contributed funds to the EEC/Asian Development Bank Parallel Co-Financed Agricultural Credit Project implemented by the BAAC. The EC portion consisted of 20 million European Currency Units (ECU) in grant aid mostly in the form of chemical fertilisers which were distributed to BAAC client-farmers in the Northeastern region through the credit in kind programme. The objective of the grant was to improve annual yields for paddy and upland crops other than cassava[1].

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1. For which the EEC had imposed an export quota standing at 6.25 million tonnes per annum during the current EEC-RTG agreement.

Under the terms of the EC component of the project, BAAC agreed to establish a Revolving Fund equal to the value of repaid principal from the original fertiliser loans. The Fund was to be used to support the Northeast Poor Farmers' Scheme which offered short- and long-term investment loans to BAAC clients in association with special efforts to provide necessary support services, particularly extension, to increase farm productivity. The total size of the Revolving Fund was 343.67 million baht.

8.2.1 Objectives of the scheme

The rationale behind the choice of components for the scheme was to enable BAAC to a) provide access to loans for larger numbers of poorer farmers; and b) to give more eligible clients, both existing and new, the opportunity to invest in the productive capacity of their farms. Under the scheme, Northeastern farmers could gain access to long-term loans either as independent borrowers or, in certain areas, within the framework of a special project, with additional support services provided by participating government agencies

Components of the scheme

The Northeast Poor Farmers' Scheme had four component projects, three of which were operational during the period 1987-91[1].

1. SUB-PROJECT 1: The Small Farmers' Recruitment and Servicing Project, designed to provide seasonal loans to small-scale farmers in association with farm production plans designed for each locality by the Department of Agricultural Extension (DoAE).

2. SUB-PROJECT 2: The BAAC/Ministry of Agriculture and Cooperatives (MOAC) Small Farmers' Special Investment Project in "Special Project Areas".

3. SUB-PROJECT 3: BAAC Individual Small Clients' Diversification Credit Packages designed to support long-term lending projects for individuals under the provisions of BAAC's normal lending regulations.

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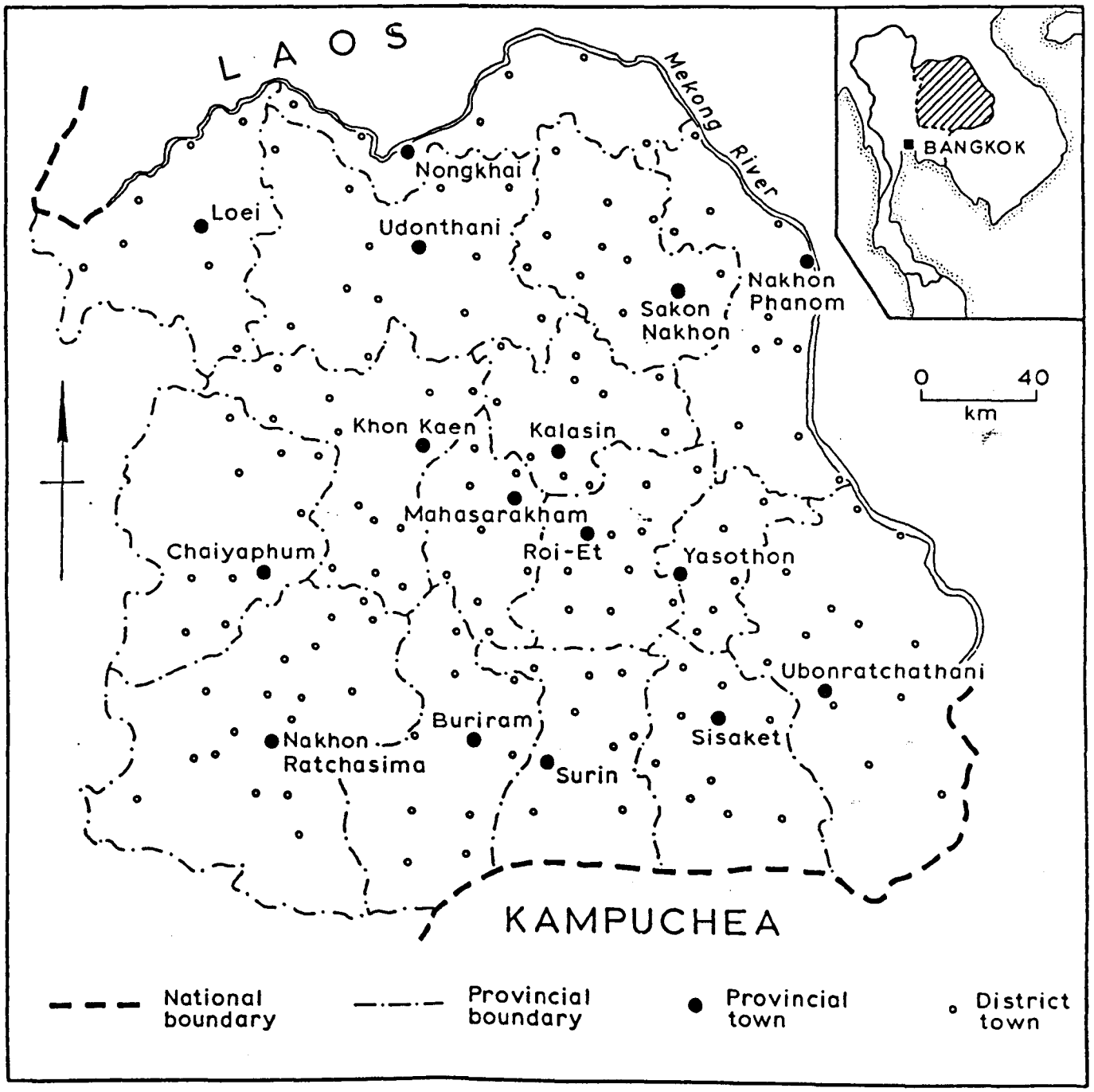
1. Sub-Project 4 which provided support for projects proposed by the MOAC for diversification into annual crops other than cassava was not implemented during the peiod 1987-1990.

FIGURE 8.1 The Northeastern Region of Thailand



8.3 The Role of Technical Support

There are few studies in the literature on agricultural credit which investigate the developmental effects of linking credit with technical support at the farm level (Scobie and Franklin, 1977). Yet for loans to be effective in accelerating technical change, it seems essential that such a linkage should exist. Loans act as a catalyst to development by providing the farmer with extra liquidity with which to purchase additional yield-increasing inputs (see section 7.2). However loans cannot promote change independently of farmers' ability to effectively utilise purchased inputs. It cannot be assumed that small-scale and marginal farmers, often by-passed by extension services, have the knowledge to apply inputs in a manner that will maximise returns. Lack of knowledge or inability to recognise the productive potential of the farm can, all things being equal, mean the difference between a loan that is used effectively to increase output and one that is not.

It is the role of the DoA to develop seed types and farming practices which yield favourable results under varying agro-ecological conditions. Adaptive research through on-farm trials leads to further refinement of the results into technical recommendations which are disseminated to farmers by field-level extension staff. Historically the Training and Visit (T and V) system, as it has developed in Thailand has operated as an independent service within the DoAE (World Bank, 1985). With the exception of some externally-funded projects, within the context of normal day to day activities, there is little active involvement with other government agencies to provide coordinated support services to the agricultural sector.

A serious concern with regard to the extension system in Thailand, has been the extent to which there is bias in service provision towards the most agriculturally progressive members of the community. Small-scale farmers, who may be interested but do not have the financial resources to take a risk with a new technology are often excluded from the benefits of extension advice (Pakdee, 1983; Sreesunpagit, 1983; Heim et al., 1986; Shinawatra and Rerkasem, 1989; Roongruangsee, 1989). Evaluations of the "contact farmer" system in Thailand suggest extension agents cannot be relied upon to diffuse technical information

within village communities (Heim et al., 1986). A study of 1,036 farmers in Northern Thailand revealed that technical information is also very unevenly disseminated among various socio-economic and gender groups, the difference being most marked between contact and non-contact farmers (Roongruangsee, 1989). In an attempt to make up for some of these deficiencies, the Small Farmers' Recruitment and Servicing Project is the first project to provide a region-wide linked credit and extension service specifically for small-scale farmers. The experience of the BAAC and DoAE in implementing the project over the period 1987/88 to 1989/90 is discussed in the following sections.

8.4 BAAC/DoAE Small Farmers' Recruitment and Servicing Project

8.4.1 Background

The BAAC/DoAE Recruitment and Servicing Project is an extension of a pilot project which operated in five Northeastern and two Northern provinces from 1984-86 funded by IFAD. This project was the first attempt by BAAC and the DoAE to provide linked credit and extension packages to small-scale farmers. One of the main assumptions behind the project design was that in order to make effective use of loans, small farmers need specialised extension support tailored to the management and resource constraints of their individual farming operations. It was for this project that the concept of recruitment of small farmers with the "potential" to effectively utilise and repay loans was first introduced and tested. The baseline study carried out in 1982 indicated 10,000 baht and below to be the median net cash farm income level of the sampled households. Thus to target small farmers, the project was opened to those with a net cash farm income of this level and below or a farm-size less than the average for their province of residence.

Cooperation between the two agencies, and therefore the effort with which the project objectives were pursued, varied from province to province. Although the results in terms of improved yields were disappointing, planners in both the BAAC and the DoAE were generally encouraged by the evaluation results, particularly with regard to repayment rates (see section 5.2.6) (BAAC, 1986), and proposed that the concept and experience gained should be built upon to replicate the project over a wider area. Hence the pilot project

became the prototype for the BAAC-DoAE Small Farmer Recruitment and Servicing Project supported by the EC.

The new project became officially operational at the start of the 1987 fiscal year in 17 Northeastern provinces, focussing on the 225 districts identified as being in need of special government assistance under the Sixth National Economic and Social Development Plan. The project provided short-term credit to poorer, smaller-scale farmers than those who would normally qualify for BAAC loans, by relying on the link between credit and extension advice as the means of making them credit-worthy.

The objectives of the new project were to:

a) Improve small farmer access to low-cost institutional loans; and

b) encourage participating farmers to make low-cost incremental changes to their farming practices for main crops other than cassava through greater use of improved inputs on the basis of farm plans for each participating tambon which were in turn, to be used as guidelines for developing credit packages for each project farmer.

8.4.2 Recruitment and disbursement

The project recruited new farmers and also extended the linked credit and extension service to existing clients who met the income or farm-size definition for the project based on their original application form. At the BAAC Head Office, targets were set for the 4-year project as follows:

Table 8.1: Year by Year Targets for Sub-Project 1
(millions of baht)

Year	1987/8	1988/9	1989/90	1990/91
Target	47	70	90	120

In FY1987 a total of 49.624 million baht was disbursed to 7,631 farmers. The programme was expanded in FY1988 with 73.297 million baht disbursed to 14,061 farmers, and 120.112 million baht in FY1989 to a total of 22,873 farmers throughout the Northeastern region. Table 8.2 shows project recruitment and loan disbursement by province for the period 1987/88 to 1989/90.

Table 8.2: Actual Recruitment and Disbursement for Sub-Project 1 FYs 1987-89

Branch/ sub-branch	FY1987 # farmers	FY1987 disbursement	FY1988 # farmers	FY1988 disbursement	FY1989 # farmers	FY1989 disbursement
Udon Thani	943	5,795,400	420	2,190,626	455	3,233,225
Khon Kaen	-	-	430	2,105,238	758	3,715,444
Chaiyaphum	508	2,149,297	1,441	6,854,423	3,415	14,821,807
Nakon Rachasima	1,011	6,878,065	788	5,469,139	913	6,318,783
Roi-et	608	2,495,255	1,091	4,620,208	1,758	7,828,130
Surin	748	4,339,819	1,649	9,775,690	2,749	18,928,700
Kalasin	-	-	767	4,030,250	2,112	12,537,650
Loei	348	1,237,642	394	1,644,260	452	1,941,740
Sakon Nakon	72	281,990	509	2,026,065	986	2,599,064
Nakon Panom	296	1,437,280	465	1,625,949	487	1,528,908
Sisaket	551	3,689,800	675	3,157,428	1,209	7,003,330
Buriram	1,266	8,413,794	1,279	6,793,738	698	3,338,243
Mahasarakham	-	-	706	2,841,855	751	3,209,954
Ubon Rachathani	-	-	401	1,827,500	455	2,309,100
Yasothon	-	-	388	1,320,400	1,042	3,673,876
Nongkhai	183	1,361,185	287	1,583,399	522	2,080,485
Phangkhon	1,097	11,544,140	523	1,922,178	1,963	6,413,224
Pimai			1,503	12,309,430	2,000	17,796,045
Nong Bua Lamphu			340	1,309,430	143	614,018
TOTAL	7,631	49,623,667	14,056	73,296,780	22,873	120,111,726

Source: BAAC records

As is evident from Table 8.2, BAAC had no difficulty in reaching the targets for this project and exceeded the disbursement target in each of the three years[1]. However during FYs 1987 and 1988 in particular, the effectiveness of the project in terms of achieving its developmental objectives was far below expectations. The reasons for this will be explained in the following sections.

8.4.3 Monitoring and on-going evaluation framework

Given the developmental orientation of the Northeast Poor Farmers' Scheme, the EC requested the establishment of a project monitoring and on-going evaluation (MOE) system. MOE for this project was jointly undertaken by BAAC and the DoAE during the period 1987/88-1989/90. The administrative system for the project consisted of the following:

1. The difference between the amount of EC grant assistance programmed and actual disbursement was made up from the BAAC's own capital fund.

a) A National Steering Committee consisting of executive-level staff from the two agencies;

b) a Central Coordinating Committee; and

c) a joint monitoring and on-going evaluation team.

The monitoring team consisted of 3-4 staff members from each organisation which divided into sub-teams every quarter to visit a selection of the Northeastern branches implementing the project. The aim of the field visits was to identify problems and constraints at the provincial, district and village levels, to give advice on policy and provide information, clarification and guidelines on implementation problems wherever possible[1]. The sub-teams compiled reports on their findings which were amalgamated into one final document each quarter and submitted to concerned management officials within both agencies. The Central Coordinating Committee (CCC) for the project, chaired by the Director of the Project Planning Division at the DoAE, met on a quarterly basis to review and follow-up the findings of the previous mission and to plan the next. The National Level Steering Committee met annually to discuss the results of the previous year's evaluation study and approve the strategy and Work Plan for the following year. The BAAC branches sent data on recruitment and disbursement measured against targets to the Head Office on a monthly basis which were summarised and reported quarterly.

The annual evaluation survey was conducted at the end of FYs 1987, 1988 and 1989 in three implementing provinces covering a sample of about 200 farmers. The objective of the studies was to assess the quality of implementation and the farm-level effects of the project among a sample of participating farmers. Ubon province was selected as the case

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1. The objectives of each trip varied according to the time of the agricultural year e.g. the planting or harvesting season. However a similar sequence of activities was followed each time. The team visited the provincial and district level authorities responsible for implementing the project to interview the BAAC branch manager, the provincial agricultural extension officer (kaset changwat), the district agricultural extension officers (kaset ampurs) in at least two implementing districts, and, the concerned tambon agricultural extension officers (kaset tambons) and BAAC credit officers. Interviews were also conducted with participating farmers in at least two districts and four tambons.

study for the credit-extension model because it was included in the evaluation study in all three years and had experienced considerable difficulty in implementing the project in 1987/88 and 1988/89.

8.5 Project implementation FYs 1987 and 1988: Ubon

This part of the chapter focuses on Ubon Ratchathani (Ubon) and highlights the various types of problems that arose during implementation of the project from 1987/8-1989/90 and the steps taken to solve them. The following is based on internal BAAC/DoAE monitoring reports compiled during this period. Most of the problems noted in Ubon were common to almost all provinces implementing the project during the first two years.

8.5.1 Establishment

The project commenced in Ubon province on 1 April 1987. The first step was to establish a provincial committee with representatives from both agencies to be responsible for selecting target districts and allocating the indicative disbursement target among them. The committee was also responsible for the establishment and supervision of joint district-level working groups consisting of BAAC and DoAE field staff who were to implement the project in the targeted tambons. The working groups were required to meet on a monthly basis to develop time-tables for joint village-level public relations meetings to advertise the project, identify eligible farmers, and develop tambon-level production/farm plans. The plans were to be based on the district agricultural extension plan and give recommendations on seed types, fertiliser and pesticide application rates mainly for rice, and suggestions regarding alternative crops or small livestock enterprises which had a potential market. According to the project work plan, farm plans were to be submitted firstly to the district level project committee for consideration, and when approved, sent to the BAAC branch which organised screening[1] for credit-worthiness and target group membership. Based on information provided by the farmers, and guided by the farm plans, BAAC officers were to

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1. Farmers had to pass through the BAAC's recruitment procedure governing lending under Regulation 7 covering short and medium term loans.

decide on the amount of credit necessary in cash and in kind to implement the farm plan. After disbursement the loans were to be closely supervised by the BAAC and DoAE field officers to ensure correct utilisation and ultimately good repayment.

8.6 Practical Problems 1987-1988

Both the BAAC and the DoAE are important vehicles for rural development policy in Thailand and the relationship between the two agencies is central to the success of this and other "integrated" projects. Yet in spite of agreement to cooperate on this project at the policy level, a number of practical problems arose during the first two years of implementation, which were symptomatic of a) weaknesses in project design and b) deeper-rooted problems between the two agencies relating to conflicts of developmental philosophy and reluctance to adapt to the demands of new initiatives. Such problems served to undermine the potential developmental effects of the project during the first two years of its operation. The manifestations of these problems are discussed in the following sections.

8.6.1 Inter-agency cooperation

Although provincial-level BAAC and DoAE staff were party to the national-level agreements between the two agencies, in practice the timetable and procedures set out for implementing the project in Ubon were not adhered to and there was virtually no project-related communication between the two agencies during the first two years. There was a strong feeling among the DoAE staff that since the project involved credit it was solely BAAC's responsibility. The collaborative aspect of the project design was ignored in years one and two and the project was implemented purely as a credit scheme.

Work schedules

Officials from both agencies gave various reasons for their unwillingness to cooperate. The first to be cited was the heavy work-load of the respective agencies. Under the Training and Visit Scheme, tambon agricultural extension officers (kaset tambons) are scheduled to spend two to three days a week visiting farmers, two days carrying out administrative duties and one day per fortnight in training. Although the project was conceived as a means to link the established working practices of the two agencies and cause

the minimum of additional work, it was not recognised as a "special project" by the DoAE and was omitted from the programme of work.

Budgetary constraints and funding arrangements

As became clear during the first year of the project, perhaps the main reason for DoAE's unwillingness to participate was budgetary in nature. As a matter of general procedure, the field staff from both agencies receive a per diem and petrol allowance for each day spent in the field. For this project, however, due to the EC's contention that the project was simply a matter of "linking" the activities of the two agencies rather than increasing their workload, no additional funds were made available to cover DoAE field officers' daily allowances or petrol costs, vehicles or other equipment necessary to carry out project-related activity. In reality, the project did require extra work from field staff but there was no incentive, financial or otherwise for them to undertake the required activities. Although the BAAC officers similarly had no direct incentive to work on the project, the branch as a whole was working to achieve all of the disbursement targets set by the Head Office, including that for the project. Hence for BAAC loan officers the motivation lay in working to obtain a good score on the year-end branch evaluation procedure (see section 5.2.7) upon which their promotional prospects and various fringe benefits depended.

A further area of contention for the DoAE was that BAAC had received funding for the project in the form of a grant from the European Community. The funds however, were being dispersed as interest-bearing loans which covered the Bank's operating expenses and made a profit which accrued solely to the BAAC[1]. The unbalanced nature of fund allocation and lack of incentives served to compound existing problems between the two agencies and adversely affected all areas of project implementation during years one and two.

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1. According to the agreement with the CEC, only the repaid principal on the fertiliser loans was paid into the "Revolving Fund" for disbursement under the project. The full interest payment accrued to the BAAC.

8.6.2 Production plans

The farm or production plans were seen to be at the "heart" of the project as the means by which to channel specialised technical advice to poor farmers. Due to the absence of instruction from the provincial office, the kaset ampurs in Ubon did not prepare production plans in years one and two. The kaset tambons interviewed during monitoring visits to the province did not know they were required to use production plans in their extension work or provide extra advice to project farmers. Consequently none of the farmers interviewed by the monitoring team were aware that they were taking part in a "special project"[1]. In some provinces, kaset ampurs did prepare production plans, but it was done simply as a "paper exercise" to send to the BAAC branches without giving copies to the kaset tambons and often arrived at the branches too late in the season[2] to be used in guiding the composition of loan packages extended by the BAAC.

8.6.3 Loan processing

In the absence of production plans in years one and two, the BAAC branch staff in Ubon and elsewhere went ahead and extended "project" loans but not necessarily to the correct target group. The majority of participants during FYs 1987 and 1988 were existing clients who had simply been "reallocated" on the basis of their net cash farm income at the time of registration[3]. In the few cases where the production plans were delivered to the BAAC branch in time, BAAC loan officers failed to take them into account when fixing loan amounts. This was indicative of the limited extent to which BAAC branch staff saw the project as a linked credit-extension exercise, as opposed to simply a mechanism for delivering

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1. Ideally, as under the IFAD-funded Pilot Project, a production plan would have been prepared for each individual farmer taking part. However this was considered impossible to replicate on a region-wide scale, with a resulting loss of attention to the individual case.

2. Most loan applications for short-term main crop loans are processed by the branches during the months of April to June.

3. For many long-standing clients, the data on which they were admitted to the project were out of date.

loans to eligible farmers[1].

8.6.4 Reporting

Although there was a considerable drive to recruit new clients for the project in FY1987, by the second quarter of FY1988 the momentum had largely disappeared. This was due in part to the problems described above, but also to the difficulties caused by a new method introduced by BAAC to computerise Head Office loan classification procedures. The outcome of the new initiative was that recruitment of new clients for the project practically stopped in year two. Under the procedure, on the basis of information provided by the branches, the Head Office was to "allocate" to the project each year any of the existing and newly recruited clients who met the qualifying criteria. The commencement of this new procedure implied that there was no longer any reason for loan officers to actively seek out new clients to join the project and communication with the DoAE in many provinces including Ubon came to a halt (see section 8.7).

8.7 Underlying Problems

8.7.1 Institutional perceptions

The history of the antagonism between BAAC and the DoAE goes back to the start of the Bank's "special project" lending activities in the late-1970s. Since this time, BAAC has worked with the DoAE on numerous occasions in implementing projects where various other line agencies including the RID, ALRO, PWD, LCO, LDD and CPD have been assigned varying degrees of responsibility for project components. In many instances other involved agencies, including the DoAE, neglected to carry out their responsibilities as specified in the project documents which had negative implications for the income-generating potential of the projects concerned. For example, there were occasions when local DoAE staff failed to

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1. Part of the reason for this situation was that the BAAC branch used different figures to the DoAE for projecting yields, crop prices and incomes for the coming year, and without specific instructions, the system did allow for the adoption of any alternative criteria.

provide good quality seedlings in time for the planting season[1] or to give sufficient technical support and training to project farmers. In other cases the RID did not complete irrigation works on time, resulting in farmers having to plant late or rely solely on rainfall. The final outcome in many cases was yields considerably below expectations and farmers unable to generate enough income from project investment to repay their loans, leaving BAAC to supervise and collect loans from investments which were no longer financially viable. As a result of such experience, the BAAC staff developed a rather defensive attitude towards cooperating with other government agencies, and the lending programme evolved in a manner which did not actively encourage this. Thus the BAAC staff in most provinces have tended to work independently of the DoAE and other agencies, despite the potential for mutually beneficial cooperation which clearly exists.

As far as the DoAE is concerned, the opinion is frequently expressed by staff at various levels, that while the BAAC is a government-owned development bank oriented to small-farmer development, it is essentially run on commercial lines and lends only to financially-secure farmers, by-passing the poorer farmers most in need of subsidised loans. There is a belief, therefore, that the Bank does not effectively serve farmers most in need of loans to promote development. Moreover, DoAE officers are aware of the BAAC's historical preference for implementing projects independently and have tended to maintain a certain distance.

8.7.2 Rationalisation

From the viewpoint of both agencies, these opinions are understandable. On the DoAE's part, they are indicative of an inadequate knowledge of the political and financial constraints within which the Bank operates (see section 4.6.7), while BAAC staff fail to appreciate the potential role of the extension in bringing about technical change and more effective loan utilisation. The bulk of BAAC's lending is for short-term production loans

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1. For example under the EC-funded Kapok Project in Nongkhai province implemented under Sub-Project 2 of the Northeast Poor Farmers' Scheme.

secured under joint-liability contracts. Its financial viability and continued existence as a service organisation depend on being able to collect repayments on time in order to recycle funds for the next production season. Consequently a strict financial discipline is imposed on all projects implemented by the Bank, including those funded from overseas sources. This type of orientation is difficult to appreciate by government agencies such as the DoAE which often advocates the "free gift" approach as the best way to help the poorest farmers. While in some cases this may be appropriate, the long-held philosophy of the BAAC is that this approach encourages farmers to over-depend on the state sector and gives little incentive to ensure inputs are used effectively[1].

What emerges from the above discussion is the remarkable lack of knowledge and understanding within each agency of the other's objectives and field procedures. A central objective of the extension worker's role is to give technical information to farmers. Very often the recommendations on topics such as controlling pests and diseases, techniques for using chemical fertiliser or introducing new cropping practices, cannot be implemented without additional expenditure and access to loans. However, only in rare cases do extension officers appear to know enough about the BAAC's services to encourage farmers to seek low-cost loans from that source. In the Northeastern region instances have been recorded where DoAE officers have recommended farmers to borrow from local money-lenders rather than encourage them to apply to the BAAC. On the other hand, extension officers may feel that poorer farmers would not meet the BAAC's eligibility criteria and have no option than to borrow from the informal sector. For the BAAC's part, credit officers often provide technical advice to farmers concerning the use of inputs and other technical questions. However, the advice they can give is limited by lack of specialist knowledge, and may have little in common with the DoAE agricultural development plan for area district. The chances of credit officers giving farmers misleading information is considerable.

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1. The bank also points to the fact that very often the quantity of inputs supplied free of charge are insufficient to bring about improvements in productivity and the inputs involved are largely wasted.

In recent years, its has become increasingly recognised in government circles that credit is only one of several support services required to promote developmental change, and that meaningful rural development depends on mutually-beneficial interaction between service agencies. Ultimately BAAC must rely on the research and development activities of other agencies within the MOAC to create new opportunities for productive investment, while the impact of the extension effort depends on farmers having access to funds to put technical recommendations into practice[1]. If BAAC is to perform its role as a developmental agency, it is of crucial importance that the Bank more actively cooperates with other government support agencies. The political pressure to do this has increased considerably in recent years. The Small Farmer Recruitment and Servicing Project has provided one such opportunity. However there is still a long way to go to develop a project design which is in keeping with the developmental needs of the farmers and the ability of the concerned agencies to provide the necessary service in an effective and efficient manner.

8.8 Project Design Weaknesses

8.8.1 Efficiency versus development goals

Many of the problems which occurred during the first two years of project implementation may also be traced to basic weaknesses in the reporting system and in the project design. Although the reporting system worked adequately at first, wholesale changes introduced by the BAAC Head Office in year two brought the project to a virtual standstill. In year two, project reporting related to an "imaginary" project which did not exist on the ground.

At the start of the 1987 fiscal year, BAAC credit officers were instructed to go into villages in the targeted districts and tambons to recruit farmers qualifying under the agreed income and farm-size definition. By the end of FY1987, each branch had a list of

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1. The IFAD-funded BAAC-DoAE Pilot Project in Small Farmer Lending was said to have boosted extension officers' morale and confidence considerably because they could arrange for participating farmers to gain access to loans to put their recommendations into practice.

participating farmers, loans had been disbursed and most branches had at least established contact with the local DoAE office in connection with the production plans. Sampling for the purposes of evaluation was easily carried out from the lists of farmer participants by village, tambon and district. There was a "real" project that could be evaluated.

At the beginning of year two however the new reporting procedure referred to above was introduced by the BAAC Head Office, which had the effect of removing the incentive for branch staff to go out to the field to recruit new farmers. The branch staff did not know who among the farmers recruited through the normal procedure that year, would be allocated to the project, nor the total amount disbursed as project loans. This was to be worked out by the Head Office computer at the end of the year. The branch staff had no reason to actively cooperate with the DoAE in implementing the project. Hence the reason many officers thought the project had come to an end after year one.

While the new procedure, once established, saved time for the branch staff, the implications of adopting it in terms of the project design were not appreciated. To the BAAC Head Office staff, it was simply a means to increase efficiency. The DoAE members of the MOE working group, saw that the project had become a "joint" undertaking in name only and that their involvement had become superfluous. The question of the DOAE officially withdrawing was discussed by the Central Coordinating Committee. Although the introduction of the procedure suggested an indifference to the developmental objectives of the project on BAAC's part, once the monitoring team had spelled out the implications to senior staff, there was immediate agreement to dismantle it and revert back to the old system of allowing the branches to select farmers. DoAE recognised that an error of judgment had been made and agreed to remain in the project on the understanding that the problem would be rectified by the start of the third year of implementation.

Disbursement problems

During the early months of FY1987, the BAAC branch managers expressed some difficulty in recruiting enough "potentially-viable" farmers who also met the qualifying criteria for the project. To remove the perceived "disbursement constraint" and widen the

pool of potentially eligible farmers, BAAC requested permission from the EC Delegation to modify the target group definition to include farmers with holdings smaller than the average for their province of residence[1]. The new definition was much broader than the income criteria applied by itself. It widened the net of potential recruits considerably and effectively reduced the "specificity" of the project targeting[2]. The new definition made it easier for the branches to disburse loans, but given the variability in land quality in different provinces, probably reduced the potential effectiveness of the project in reaching poorer farmers genuinely in need of special assistance. That the EC Delegation agreed to this change perhaps without fully understanding the implications in terms of targeting, reflected an over-riding concern with disbursement on the part of the donor agency as well as the Bank.

8.8.2 Lack of incentives

Perhaps the most serious of the design problems during the initial two years was the lack of any incentive, financial or otherwise for the DoAE to effectively carry out its assigned role under the project. The need for such an incentive should have been appreciated when the project was prepared and appraised. During years one and two, all of the financial advantages from this grant-assisted project accrued to BAAC. With hindsight it was a serious omission in the project design to expect the full and active cooperation of the DoAE without some form of overt recognition.

8.8.3 Lack of supervision and guidance

Given the historical antagonism between the two agencies, the project design required a level of cooperation between BAAC and DoAE which was unprecedented on a regional scale. During the first two years, despite training courses provided for senior staff, the provincial, district and tambon-level officials involved in the project received insufficient

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1. This definition had previously been used in the First World Bank-funded credit project operated through BAAC.

2. Depending on the productivity of his land and the types of enterprises engaged in, a farmer with 20 rai could be relatively well of. Many farmers admitted to the project under the farmsize definition were already clients of the BAAC.

guidance and written instruction as to how to administer the project and maintain the momentum with regard to pursuance of the developmental objectives. In summary, the first two years were a learning period during which many of the sensitive areas of project design and implementation came to the fore.

8.9 New Measures, 1989/90

Based on knowledge gained through monitoring and training activities carried out during years one and two, the Central Coordinating Committee introduced a number of changes in procedure in year three which led to some improvements in implementation in most provinces:

8.9.1 Recruitment

Due to the reversion back to the original procedure which gave the branches total responsibility for identifying eligible farmers, progress with respect to the recruitment of new clients regained momentum during FY1989. The BAAC's Northeastern Loan Division issued an instruction to all 17 branches in June 1989 that in future at least 10 per cent of the project recruits had to be new clients. This target was built into the Branch Evaluation Procedure and provided a greater incentive for loan officers to seek out larger numbers of eligible farmers to join the project.

8.9.2 Operational costs for MOE

The EC Delegation agreed to earmark a small amount of funds to cover expenses incurred by the BAAC/DoAE Monitoring Team in carrying out quarterly field trips and the annual evaluation surveys. This gesture led to further improvements in working relations between the two agencies at the national level. No financial incentives were however given to DoAE staff at the field level.

8.9.3 Training for field staff

The training sessions held for provincial and district level staff during the first eighteen months had little positive effect on project implementation. The monitoring team concluded that senior staff could not be relied upon to train junior staff working with the farmers. In an attempt to remedy this situation, one-day training workshops were organised

for field staff in all Northeastern provinces from December 1988 to January 1989. Members of the joint monitoring team acted as resource persons for each session which provided an opportunity for problems and constraints to be discussed with a view to finding solutions to local problems for the 1989/90 crop year. Copies of the updated instruction manual were distributed to all kaset tambons for reference purposes.

8.9.4 Administration and devolution

There was some noticeable improvement in inter-agency cooperation during FY1989 in many Northeastern provinces, but perhaps most obviously in Ubon where working relations were very weak during the first two years. This was due in part to the CCC laying down stricter guidelines regarding procedures and reporting. At the start of the year, the CCC issued instructions to each province and district committee describing in detail their duties, specifying the number of meetings to be held during the year, the topics to be discussed at each meeting and the budget for loan disbursement in each targeted district. The guidelines, proposed timetable and agenda for discussion provided a clearer sense of purpose for the committees in coming together on a regular basis. The combined results of the new measures was that joint provincial and district meetings were held for the first time in Ubon and more frequently elsewhere. The monitoring team observed that working relations and the level of contact between DOAE field staff and project farmers showed some improvement in many districts. In addition to the 10 per cent rule on recruitment of new clients, the BAAC Head Office issued instructions to all Northeastern branches emphasising the long-term nature of the project and the need for closer cooperation with the DoAE within the context of the project design.

A further innovation in year three was that many provincial committees devolved responsibility for implementation to district committees which were given responsibility not only for selecting target tambons but also for advertising the project through village meetings and contacts with local headmen and kamnans as well as drafting production plans and carrying out public relations. The committee secretaries were expected to keep minutes from the meetings and submit copies to the Bangkok-based working group to enable regular

updating of the monitoring records. The CCC also recommended that the BAAC and DoAE field officers should make supervisory visits to the project farmers, either together or separately, at least three times per year.

8.9.5 Farmer participation and production plans

A further result of the new instructions in Ubon was that most of the farmers recruited and interviewed by the evaluation team in FY1989 were aware that they were participating in a special project, knew of the existence of the production plans, and that the loans they received from BAAC were related to the advice given in the production plans (see section 9.4.10). In addition to the use of inputs, the production plans prepared in FY1989 included some ideas for the integration of new crops and small livestock. Some districts started work on the production plans as early as February 1989 and in almost all of the 32 districts visited by the monitoring team during the year, the production plans were delivered to the BAAC in time to be used in fixing loan packages for individual farmers.

8.10 Conclusions

The effectiveness of the "credit-extension model" in supporting development of the small farm sector basically depends on the establishment of a successful working relationship between BAAC and the DoAE. At the national level, both agencies now appear to appreciate that potential for mutually beneficial interaction to a) create new lending opportunities for BAAC; and b) to enable farmers to put appropriate extension messages into practice does exist[1]. In the interests of agricultural development in Thailand, such interaction can no longer be avoided[2]. The Small Farmer Recruitment and Servicing Project

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1. The improved morale noted among tambon extension officers involved in the IFAD-funded Pilot project in Small Farmers Lending was largely due to their ability to ensure low-cost credit would be provided in conjunction with the farm plans designed for each farm to enable farmers to put them into practice (BAAC, 1986).

2. Encouraged by progress in the development of working relations between the two agencies brought about during the course of the Small Farmer Recruitment and Servicing Project, there were plans in 1991 to extend the concept of a linked credit-extension service provision for small-scale farmers to all regions of the country under the "Small and Poor Farmers' Credit Speed-Up Project". Additional government funding is to be made available for this purpose.

called for a level of cooperation between the two agencies, which was unprecedented on such a wide scale. Underlying tensions between the two agencies, differences in their working practices and philosophies and inadequate attention to project design features, resulted in practical problems which effectively neutralised the developmental impact of the project during the first two years. However the experience gained during this period, led to some important changes in procedure in year three which established a better basis for cooperation in many provinces, including Ubon during FY1990/1. There is a continued need for joint planning at all levels[1], flexibility in operating procedures, training for field officers and incentives to encourage them to find ways to dovetail the working practices of the two agencies to create an environment conducive to supporting the small farmer sector.

The next chapter uses the results of an evaluation study carried out among a small sample of project farmers in Ubon province to describe the agro-economic characteristics of the sampled paddy farmers and attempts to illustrate the relative effects of credit and extension as determinants of farm productivity within a simple model representing the 1989/90 crop year

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1. One of the main strengths of the project administration during years one and two was the professional relationship established and maintained between the BAAC and DoAE members of the MOE working group.

CHAPTER IX

THE CREDIT-EXTENSION MODEL, UBON RATCHATHANI PROVINCE

9.1 Introduction

This chapter uses the results from an evaluation study carried out in Ubon province[1] in February 1990, to examine the relationship between short-term loans, technical support and productivity among a small group of rice farmers participating in the Small Farmer Recruitment and Servicing Project. The first section briefly describes the project area and the main farming characteristics of the sampled farmers, while the remainder of the chapter goes on to develop a simplified path model, representing the third year of project operations to illustrate the effects of the credit and extension on farm productivity during the 1989/90 crop year.

By incorporating a technical support variable, the model represents a logical progression from the "credit-only" case examined in Chapter VII. The two models are not directly comparable however. In view of the relatively small sample size in Ubon and to control for the effects of farm-size, the variables are measured on a per rai basis. The model focuses on rice, which was the main cash crop planted by the sampled farmers in the 1989/90 crop year, and the crop around which the farm production plans and credit packages were assembled.

9.2 General Features of the Study Province

Table 9.1 shows the general agro-economic features of Ubon province in 1988/9. Average farm-size of 31.86 rai was somewhat higher than the regional mean of 28.17 rai as measured by the OAE in 1988 (OAE, 1987/88). Local farmers generally own the area they cultivate, with only a small proportion depending solely on rented land. As in most Northeastern provinces, paddy production is by far the most important form of land use, with

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1. Ubon was one of three provinces included in the evaluation of the Small Farmers' Recruitment and Servicing Project carried out in February 1990. The other two provinces were Sisaket and Nakon Panom.

only nine per cent of the cultivated land under field crops such as cassava.

Table 9.1: General Features of the Study Province, Ubon 1988/89

Mean farm-size (rai) a/	31.86
% of holdings: b/	
- wholly owned	73.00
- wholly rented	.20
% of area under: a/	
- rice	69.01
- field crops	8.47
- tree crops	1.69
% of land use treated with chemical fertiliser b/	47.93
- riceland	57.80
- field crops	47.50
Mean rice yields (kgs/rai) a/	206
% of riceland irrigated a/c/	5.45

Sources: a/ Figures refer to 1988, Agricultural Statistics of Thailand, Crop Year 1988/89; b/ Inter-Census of Agriculture, 1983, National Statistical Office, Thailand; c/accumulated irrigated area in 1987/88 divided by the total rice area, OAE, 1988/89.

As in other Northeastern provinces, the farmers in Ubon have traditionally preferred to grow and consume glutinous rice. Non-glutinous varieties have been adopted more recently, mainly for sale rather than home consumption. Farm-gate prices for non-glutinous rice are normally higher and marketing opportunities better than for glutinous rice. Soils in Ubon tend to be infertile, there has been limited irrigation development within the province and agricultural productivity is well below the national average. The average yield for main crop paddy was 206 kgs/rai, compared to the regional mean of 237 kgs/rai and a national mean of 316 kgs/rai in 1988/89 (OAE, 1988/89). According to the most recent Agricultural Census (NSO, 1983), 74 per cent of the farm households use a combination of chemical and organic fertilisers on rice. Almost 58 per cent of the riceland is treated with chemical fertiliser and 48 per cent of the upland area.

9.3 The Household Survey

9.3.1 Objectives of the survey

The objective of the household survey was to investigate the agro-economic characteristics of farmers participating in the project and any changes in farming practice, productivity and income levels that may have occurred since joining. Although the sample included some existing clients, all of the 61 farmers interviewed in February 1990 were new to the project at the start of the 1989 crop year. They had therefore been in the project for approximately one production year at the time of the survey.

9.3.2 Sampling method

The method used for selecting the sample for the project was purposive. This method is often used in case studies where the objective is detailed study of a particular topic and where the population is fairly homogeneous (Casley and Lurey, 1987). Although there is debate over the academic rigour of the case study approach, Casley and Lurey (1987) make the point that

> "some researchers employing the case study approach believe that random selection of the final unit and boosting of the number of respondents are essential if their survey is to achieve "respectability". However, if the general structure of the survey is such that no statistically valid generalisation of the results to a wider population can be made, these measures may be fruitless, and nullify the advantage of the case study method, if the increase in the number of interviews reduces the in-depth quality of the data" (p.65).

Where time and resources are limited the main question to be asked in choosing a sampling method for a particular survey should be "what method is most appropriate to the current stage of the enquiry given the resources available?" (Casley and Lurey, 1987, p. 65).

Case studies and other rapid appraisal techniques[1] including focus groups are particularly useful in project monitoring and evaluation activities where the aim is to generate information quickly and efficiently to show whether a project is being implemented correctly, is working towards its developmental objectives and if any "fine tuning" is necessary to the project design. The insights provided by representative case studies are also useful in project evaluations to supplement the analysis carried out by conventional methods (see Chapters X and XI) to measure project results and impact (Grandstaff et al, 1987). The main limitation of the case study method however is that of generalising the results beyond the study area (Poate and Daplyn, 1988; Casley and Lurey, 1987). Given the purposes of this survey however, within the broader scope of the monitoring and evaluation framework for the Northeast Poor Farmers' Scheme as a whole, this was not considered to be a major drawback.

Purposive sampling was chosen as an appropriate technique for monitoring and evaluation of this project, because of the relative homogeneity of the farmers involved, all of whom belonged to a particular target group. In order to serve the information requirements of the donor and decision-makers at various levels, the need was to generate information on pertinent questions quickly and efficiently, on a limited budget of time and manpower, to enable a regular assessment of the project's progress in relation to its goals and to assist the National and Central Coordinating Committees in setting policy and implementation guidelines for the following year.

Sampling for the study was carried out in three stages. Two districts, omitted from the previous years' evaluation, were purposively selected on the basis of the number of farmers

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1. The use of rapid rural appraisal (RRA) methods including case studies and purposive sampling as a means to study farmers with particular characteristics, has gained increasing acceptance since the late 1970s. While the need for scholarly research involving large scale, randomly selected samples is not questioned, there has been concern that despite the time and expense involved in large-scale surveys, they often fail to generate timely information of the type required for policy formulation and day-to-day decision-making. Where time and funds are insufficient to carry out a large-scale survey, which is usually the case in government organisations, careful rapid appraisal can be more cost effective given the information needs of the organisation (Carruthers and Chambers, 1981). The application of rapid appraisal in rural development are discussed in Hildebrand (1981), Rhoades (1982) and Grandstaff et al. (1987).

recruited in FY1989. Within each district, two tambons were selected, according to the same criteria. Within each tambon, the aim was to carry out a complete enumeration of the participating farmers. In total, 61 farmers were interviewed[1]. The household interviews were supplemented with informal discussions with government officials, village leaders and farmers concerned with the project so as to gain a greater understanding of the problems and constraints

9.3.4 Data collection and analysis

Data collection for the survey was carried out by the project monitoring team[2] which comprised two officers from the BAAC Head Office and one from the DoAE. A short questionnaire was used in order to measure various aspects of the sampled farmers' agro-economic status, production, expenditure, income, use of technology and contact with support services during the first year of project participation. The questionnaire was designed to meet the needs of simple descriptive analysis, using DBase III and SPSS, focusing mainly on the financial aspects of the farming operation[3]. The Table below shows the number of farmers interviewed in the two study districts in Ubon province. The "before" project data, collected from the original loan application forms kept at the BAAC branch, relate to their agro-economic characteristics in the year prior to joining the project 1988/89, and "after" to the 1989/90 season, based on farmer recall.

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1. Using BAAC branch records showing the address and registration number of each farmers and the particulars of his farming operation given at the time of interview.

2. Under supervision of the BAAC Monitoring and Evaluation Specialist.

3. The usual approach adopted by a financial institution.

Table 9.2 : No. of Project Farmers Interviewed by District, Ubon Province, 1990

District	Sample size
Trakanpeutpon	31
Amnat Charoen	30
Total	61

Source: Household Survey

9.4 Survey Results:

9.4.1 Qualification

Of the 61 project farmers interviewed, 92 per cent met the farm-size criteria for joining the project, while 70 per cent qualified under the income definition and many qualified under both. While the area a farmer cultivates does not vary significantly from year to year, income may be subject to marked annual variation in line with natural hazards, fluctuating yields and output prices. The income definition is therefore considered to be a more effective means of targeting poorer farmers. Ubon branch was reasonably successful in this respect in FY1989.

9.4.2 Farm size[1] and land use

Average farm-size for the sampled farmers of 24.25 rai was considerably less than the average for the province as a whole of 31.86 rai (OAE, 1988/89), an indication of the lower economic level of the project farmers. The slight change in farm-size during the first year of the project may be accounted for by sampling error (Table 9.3)

1. Total area available for cultivation in the 1989/90 crop year.

Table 9.3: Farm-Size Compared to OAE Estimate and Land Use, Ubon, 1989/90

FARM-SIZE, OAE (rai)		31.86
Sample	BEFORE (rai)	23.57
	AFTER	24.25
RICELAND (%)		
Sample	BEFORE	74.50
	AFTER	79.07
UPLAND (%)		
Sample	BEFORE	23.28
	AFTER	16.56
OTHER (%)		
Sample	BEFORE	3.41
	AFTER	7.83

Source: Household survey

Rice, both glutinous and non-glutinous were the main cash crops grown in 1989/90. The survey showed no increase in the areas planted to glutinous or non-glutinous rice during the year under study and cassava was not found among the sampled farmers. A small area was planted to cucumber for home consumption and for sale (Table 9.4).

Table 9.4: Mean Areas Planted to Major Crops, Ubon Province (rai), 1989/90

RICE - Non-glutinous	
Before	10.65
After	10.96
RICE - Glutinous	
Before	14.37
After	14.08
OTHER	
Before	2.69
After	2.32

Source: Household survey

9.4.3 Production and sales

Farmers in the Northeastern region generally produce non-glutinous rice for sale rather than for consumption, and normally larger areas are planted to non-glutinous than to glutinous. The opposite was true among the sample in Ubon in 1989/90. Total production of

non-glutinous rice during year one increased from 2,230 kgs. to 2,778 kgs. and close to 90 per cent of the output was sold. Total production of glutinous rice also increased from 3,182 kgs. to 3,457 kgs., possibly due to the project's emphasis on increased fertiliser use. Only about one quarter of the total output was sold each year, the bulk being kept for home consumption. Close to 100 per cent of the cucumber harvest was sold in both years.

Table 9.5: Total Mean Crop Production (kgs) and Percentage Sold, Ubon Province, 1989/90

Rice: Non-glutinous	
Before	2,230
After	2,778
Percentage sold	
Before	93
After	87
Rice: Glutinous	
Before	3,180
After	3,457
Percentage sold	
Before	25
After	24
Other	
Before	678
After	509
Percentage sold	
Before	98
After	95

Source: Household survey

9.4.4 Use of improved varieties

One of the primary objectives of the agricultural extension programme in the Northeastern region has been to encourage farmers to change from growing native to improved and high-yielding varieties of rice. Seeds were available through the DoAE and the private sector. Even before the project started however, few farmers in Ubon were using native rice seed varieties and there was little change in the numbers using different types during the first year. The transition from native to improved/high-yielding varieties was

largely completed before the farmers joined the project. For non-glutinous rice, the percentage of the sample using improved or high-yielding varieties increased from 64 per cent before joining the project to 75 per cent one year later. Eight per cent of the sample continued to use the hardier, native varieties during the first year of the project and the balance of the sample, used a combination of seed types.

9.4.5 Use of fertiliser

Table 9.6 shows the percentage of project participants using chemical and organic fertiliser before and one year after joining the project. Given the objective to increase chemical fertiliser use, and the BAAC's practice of giving credit for fertiliser in kind (see section 4.10), an increase in the proportion of farmers using chemical fertiliser would be expected in year one. Urea is recommended by the DOAE as a top dressing for rice in the Northeast and actively promotes the use of organic fertiliser as an alternative source of low-cost nutrients.

Table 9.6: Percentage of Sampled Farmers Using Different Types of Fertiliser, Ubon Province 1989/90 (n=61)

Chemical fertiliser	
Before	92
After	98
Urea	
Before	24
After	19
Organic	
Before	55
After	65

Source: Household survey

According to the survey data the percentage of farmers using chemical fertiliser (16-20-0 and 16-16-8) on rice was over 90 per cent before the project started and increased to 98 per cent in the first year. As for improved and high yielding seed varieties, it appears that the adoption of chemical fertiliser was already well advanced before the project started. Between 19 and 24 per cent had started using urea as a top dressing for paddy. Commercially-produced organic fertiliser is available to farmers through BAAC's credit in kind operation, and at the

time of the survey, the DoAE was implementing a project to encourage farmers to make their own organic fertiliser from waste products on the farm. Limited quantities of biological catalysts, to speed up the decomposition process, were also available from the DoAE. The percentage of sampled farmers using organic fertiliser increased from 55 to 65 per cent during the 1989/90. This may be associated with the extension messages put across by the project, however, many farmers complained that the amount of work involved in making organic fertiliser, the difficulties of finding enough farmyard manure and the cost of transporting it to the fields were serious constraints on its use.

Encouraging farmers to use closer to the DOAE recommended amounts of chemical fertiliser[1] as a means to increase yields per rai was one of the primary objectives of the project. Table 9.7 shows the mean fertiliser application rates per rai for the sampled farmers before joining the project and in 1989/90 for both types of rice.

Table 9.7: Mean Fertiliser Application Rates for Rice, Ubon 1989/90 (kgs/rai)

	Non-Glutinous	Glutinous
Chemical fertiliser		
- Before	15.45	13.70
- After	17.69	18.80
Urea		
- Before	1.26	1.28
- After	.94	1.24
Organic fertiliser		
- Before	112.78	38.59
- After	154.27	57.39

Source: Household survey

The application rate for farmers who used chemical fertiliser on non-glutinous rice increased slightly from just over 15 kgs./rai to 18 kgs. during the first year of the project. The small increase in both cases may be associated with the additional credit and technical advice

1. Between 25 and 35 kgs./rai for the Northeastern region depending on soil type and composition.

made available by the project intervention. However, the amount used, was still considerably below the 25-35 kgs./rai generally recommended by the DoAE in the Northeastern region. On the other hand, the application rate for organic fertiliser on the non-glutinous crop produced mainly for sale, increased from 113 kgs./rai to 154 kgs./rai. Chemical fertiliser application on glutinous rice increased from 14 kgs./rai to 19 kgs./rai during year one, and organic fertiliser application increased from 39 kgs./rai to 57 kgs./rai. Urea remained of minor importance for both crops.

9.4.6 Yields

Yields are a notoriously difficult variable to measure accurately without investing considerable time in carrying out a crop cutting and weighing exercise, at which the interviewer must be present or alternatively laying out a yield sub-plot at the start of the growing season. Neither of these options were open to the survey team and the following table is based on a simple division between the total production during each year and the planted area, averaged for the sample as a whole. Table 9.8 compares the mean yields for glutinous and non-glutinous rice before and after the project with figures published by the OAE for the 1988/89 crop year.

Table 9.8: Mean Yields for Glutinous and Non-Glutinous Rice, Ubon, 1989/90 (kgs./rai)

Provincial mean for main crop rice, 1988/89	206
Non-glutinous	
- Before	251
- After	315
Glutinous	
- Before	271
- After	298

Source: Household survey

The estimated mean yield for non-glutinous and glutinous rice among the sampled farmers in 1989/90 were 315 kgs./rai and 298 kgs./rai respectively, in each case close to 50 per cent higher than for the 1988/89 year as measured by the OAE. While comparison of yields in

the before and after situation is problematic, there appears to have been an improvement for both types of rice which may have been associated with the increased use of fertiliser, technical advice and favourable weather conditions during 1989/90. This however remains a tentative conclusion only.

9.4.7 Farm income

Gross farm income from rice and cucumber sales increased by almost 26 per cent from 11,367 baht to 14,279 baht during 1989/90, with a corresponding increase of 32 per cent in production costs from 2,883 baht to 3,801 baht. The gross margin for rice increased from 360 baht/rai before the project to 432 baht/rai one year later. The net income situation is given in Table 9.9.

Table 9.9: Gross Farm Income and Expenditure, Ubon 1989/90 (baht)(n=61)

Gross income from farm production:	
- Before	11,367
- After	14,279
Total production costs	
- Before	2,883
- After	3,801
Net farm income	
- Before	8,484
- After	10,478
Gross margin/rai	
- Before	360
- After	432

Source: Household survey

9.4.8 Income by source

Table 9.10 summarises and compares income levels by source for the project farmers against regional figures published by the OAE for 1986/87.

Table 9.10: Summary of Income Levels and Sources, Comparing Survey Data with OAE Figures, Ubon 1989/90

	Net farm income		Non-farm income		Total income	
	Baht	%	Baht	%	Baht	%
NORTHEAST (OAE) 1986/87	6,664	37	11,246	63	17,910	100
UBON, 1989/90						
- Before	8,484	60	5,747	40	14,231	100
- After	10,478	64	5,947	36	16,425	100

Source: Agricultural Statistics of Thailand, Crop Year, 1988/89, OAE, 1989; Household Survey.

There was a 24 per cent rise in earnings from on-farm sources during the first year of the project, which may be associated with the apparent increase in rice yields and improved prices for paddy in the year under study. Earnings from non-farm sources, remained fairly constant. This suggests no major shift in labour resource allocation between farm and non-farm activities as a result of project participation. Overall net household income increased by almost 16 per cent over the previous year. There was little change in the proportion of income contributed from farm and non-farm sources with 60-64 per cent of net income being generated on-farm. The pattern is the reverse of that recorded by the OAE for the Northeastern region in 1986/87, when over 60 per cent of total household income was recorded as having come from non-farm sources.

9.4.9 Savings and borrowing

The sampled farmers reported that the average amount of savings in-hand and on deposit, increased from 4,214 baht in 1988/89 to 4,753 a year later, a rise of 13 per cent over the previous year (Table 9.11). The average project loan size for the sampled borrowers of 3,918 baht covered over 100 per cent of production costs in the year under study.

Table 9.11: Savings and BAAC Loans, Ubon (baht), 1989/90

Savings	
- Before	4,214
- After	4,753
BAAC ST project loan FY1989	3,918

Source: Household survey and BAAC records

9.4.10 Extension and supervision

Table 9.12 describes the mean number of extension and credit supervisory visits received by the sampled farmers during the period July-December 1989.

Table 9.12: Mean Number of DoAE and BAAC Visits from July-December 1989, Ubon Province

	DoAE	BAAC
House visits	1.19	3.34
Meeting attendance	1.95	2.16
Farmer requests for advice at district office	.39	1.48

Source: Household survey

The mean number of visits from the local DoAE kaset tambons during the period July-December 1989 was 1.19 per household. Project farmers attended an average of 1.95 monthly extension meetings or one meeting in three during the six-month period, but rarely visited the district office of the DoAE to request advice on farming matters. For BAAC, the project farmers said they received an average of 3.34 visits from loan officers during the six-month period. This is indicative of the generally high level of supervision accorded to small farmer borrowers once they have become registered clients, irrespective of the high transaction costs involved in supervising small loans (see section 2.4.3). Project farmers visited the BAAC district field office an average of 2.16 times during the period and made

1.48 visits to the provincial branch office to apply collect and repay loans[1]. The number of farm-level supervisory visits is more than would be expected for a non-project client who normally makes two visits to the district office is the norm; a) to apply for a loan and b) to collect inputs.

Table 9.13 shows farmers' response to the question of changes in the frequency of home visits from DoAE and BAAC field officers during project participation. Twenty-seven per cent of the sample claimed not to have received any visits from DoAE staff since joining the project, while 49 per cent said the frequency of contact remained the same. It is significant however that 29 per cent said the frequency of contact had increased over the previous year. The tendency for kaset tambons to concentrate their attention on the most receptive and the larger-scale farmers is discussed in section 8.3.

Table 9.13: Percentage of Farmers and Change in Frequency of Contacts with DoAE and BAAC Field Staff Since Project Started, Ubon, 1989/90 (%)

	DoAE	BAAC
No. of contacts:		
None	27	-
Increased	29	63
Decreased	3	-
No change	41	37
	100	100
% of farmers knowing about the production plan	65	

Source: Household survey

With regard to visits from BAAC credit officers, all of the sampled farmers were visited during the year. Sixty-three per cent reported that the frequency of contact had increased, while 37 per cent[2] said the number of visits remained about the same.

1. BAAC clients also had the option of repaying loans through the district Post Office.
2. Existing clients who had joined the project.

Improvement in the level of cooperation between the two concerned agencies during 1989/90 was reflected in a significant percentage of present farmers (65 per cent) knowing of the existence of the production plans designed for their tambon of residence.

The sampled farmers were also asked to give their main source of information on technical matters related to farming. The results are shown in Table 9.14.

Table 9.14: Sources of Information on Technical Matters, Ubon, 1989/90

	DoAE	BAAC
Improved seeds	54	13
Crop diversification	10	13
Livestock raising	29	11
Fish raising	-	13
Chemical fertiliser	49	24
Organic fertiliser	39	8
Other production technology	-	3

Source: Household survey

DoAE was more important than the BAAC in giving technical advice on improved seeds, raising small livestock and on using chemical and organic fertiliser. The sample claimed that BAAC was slightly more influential than the DoAE in giving technical information on crop diversification[1] and fish raising[2]. The reduced role of the BAAC in giving technical advice in many of these areas compared to the previous year (BAAC, 1989), suggests the kaset tambons took on a higher profile within the project in 1989/90. This was in keeping with the improved working relationship between the two participating agencies. In most cases, technical advice from a dedicated extension agency and trained field staff is preferable to that given by non-specialist bankers.

1. A major objective of this project and of the Northeast Poor Farmers' Scheme generally.

2. The responsibility of the Department of Fisheries.

9.5 The Credit-Extension Model

Having discussed the general agro-economic characteristics of the case study farmers, the next part of the chapter uses the same data to examine the role of the credit and extension in relation to input use and income from rice production during the 1989/90 crop year. The analysis attempts to explore the notion frequently raised in the literature that loans are likely to be a more effective catalyst in raising farm productivity and incomes when accompanied by dedicated extension support. The analysis is carried out for rice production which was the most important source of income among the sampled farmers and the main crop for which chemical fertiliser was applied.

9.5.1 The hypothesised model

The simplified model shown in Figure 9.1 depicts the hypothesised relationships between variables which influenced the outcome of investments in rice production for the sample of project farmers in Ubon province. All of the variables relate to the combined production of glutinous and non-glutinous combined rice. As for the model tested in Chapter VII, path analysis is used to examine the inter-relationships between the variables concerned. The technical aspects of the method and its suitability for this type of analysis are discussed in section 7.4.2. In line with the requirements of path analysis, there is a temporal sequence implied by the model which represents one agricultural year. Some of the underlying assumptions are however different to those employed for the "credit-only" configuration, due to the greater emphasis BAAC places on liquidity reserves as a measure of credit-worthiness when land and labour resources are limited (see section 7.5.6).

The hypothesised model for the credit-extension package is given in Figure 9.1. At the start of the cropping year, it is hypothesised that the farmer has a certain amount of working "CAPITAL RESERVES"[1] at his or her disposal, carried over from the previous

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1. Savings, measured as cash in-hand and on deposit "before" the project started is taken as a proxy measure for this variable.

harvesting season[1]. This represents the amount of capital the farmer has available to invest in inputs for rice production at the start of the season. Following the Bank's normal application procedure, the credit officer calculates how much the farmer needs to borrow to cover anticipated production expenses for the coming year based on recommendations provided in the DoAE farm plan for that tambon. In this model, the amount a farmer borrows for rice in short-term production "LOANS", is hypothesised to be positively dependent on the farmer's own contribution in the form of "CAPITAL RESERVES" and the potential to earn additional income from "OFF-FARM" sources. "OFF-FARM" income is in turn hypothesised to be positively related to "CAPITAL RESERVES", on the assumption that "OFF-FARM" income is an important determinant of farm-household liquidity. The total amount of all types of "FERTILISER" (including chemical, organic and urea) used on rice in kgs. per rai is in turn assumed to be dependent on how much the farmer can borrow from BAAC "(LOANS)" and supplementary earnings from non and off-farm sources "(OFF-FARM)".

The second exogenous variable in the model and the variable of particular interest in this analysis is called "TECHNICAL SUPPORT". This is a composite index, a measure of the average number of contacts each of the sampled project farmers received during the period July to December 1989. Six variables were used to form the index, three relating to contacts with BAAC officers and three to contacts with DoAE staff. For each agency, the three variables were:

- Number of house visits received during the cropping season;
- number of visits to the district office to seek advice on credit or extension matters;
- number of visits to the provincial office.

Each constituent variable was weighted according to its relative importance in terms of closeness of contact between the agency and the farmer. Therefore a home visit received a

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1. The justification for hypothesising working "CAPITAL RESERVES" as an independent variables in given in section 7.4.4.

higher weighting than a visit to the district office and a visit to the provincial office a lower weighting than a trip to the district office. Given the objectives of the project design in encouraging farmers to use loans to purchase additional quantities of yield-increasing inputs, the total amount of "FERTILISER" used, the main item of input expenditure, is hypothesised as dependent on the amount of "TECHNICAL SUPPORT" a farmer receives from the BAAC and DoAE officers. Rice "YIELD", measured in terms of the value of production per rai, is hypothesised as directly dependent on the amount of "FERTILISER" used and on the level of "TECHNICAL SUPPORT" provided by field staff from both agencies.

9.5.2 Testing the model

The theoretical model described above was tested using path analysis and yielded results as shown in Figure 9.2. The figures show a positive and statistically significant relationship between the amount borrowed, LOANS, and the amount of CAPITAL RESERVES available at the start of the crop year (p_{31}=.334). Contrary to expectations, however, the tested model does not show a statistical relationship between earnings from OFF-FARM sources and the amount borrowed. While off-farm income is regarded as a "safety net" in the Northeast when crop production is low (Meyer and Alisbuscan, 1984; Wongsekiarttirat, 1986), due to fluctuating employment opportunities, loan officers may not give it as much weight when assessing farmers' initial capacity to repay loans. It remains, however, a potential form of insurance when income from crop production falls below expectations.

There is, as hypothesised a positive and statistically significant relationship between CAPITAL RESERVES at the start of the year and earnings from OFF-FARM sources (p_{21}=.366). The negative relationship between OFF-FARM income and the total amount of FERTILISER used is contrary to expectations and rather weak at p_{42}=-.131. This may be explained by the fact that in view of access to loans under the project, off-farm income was not used to the same extent in funding farming activity, but for other purposes within the farm-household. There is however a positive and direct effect between LOANS and the total

amount of FERTILISER used (p_{43}= +.455), even though BAAC loans are normally only used to purchase chemical fertiliser and possibly urea. Despite the inherent limitations of the way in which the variable is specified, this relationship is statistically significant and provides substance for one of the main assumption upon which the project was developed, namely that farmers with access to low-cost loans are more likely to use greater amounts of productivity-increasing inputs, particularly chemical fertiliser[1]. The variable of most interest in this analysis, TECHNICAL SUPPORT, has a positive and direct effect on the amount of fertiliser used (p_{45}= .206). Taken together LOANS, OFF-FARM income and TECHNICAL SUPPORT "explain" 21 per cent of the variation in the amount of fertiliser used (R^2=.207). The path coefficient between the two variables FERTILISER and YIELD, measured in terms of the value of rice production per rai, is positive, but weaker than expected at p_{64}=.299, just failing to achieve statistical significance at the 90 per cent level. The farm-gate price for paddy is unlikely to have had a major influence on this relationship, as most of the sampled farmers sold immediately after the harvest, with little variation in the prices received. Finally, contrary to expectations, the relationship between TECHNICAL SUPPORT provided to the farmer and YIELD is negative and considerably weaker than expected at p_{65}=-.204. This relationship is non-significant and suggests that within the context of this model, the influence of technical support ceases once the crop has been planted and fertiliser applied. Alternatively, the result may indicate that the number of extension visits is not the best measure of the effectiveness of technical support. Other proxy measures of the influence of extension on propensity to use additional inputs would be adoption rates and incremental changes in production levels.

Comparing the size of the path coefficients, the results of the analysis point to the conclusion that, during the first effective year of project operation in Ubon, loans were the most important influence on farmers' use of technical inputs. The role of technical support, though positive, was still weak.

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1. Usually given as credit in kind by the BAAC.

FIGURE 9.1 HYPOTHESISED ROLE OF CREDIT WITH TECHNICAL SUPPORT AT THE FARM LEVEL

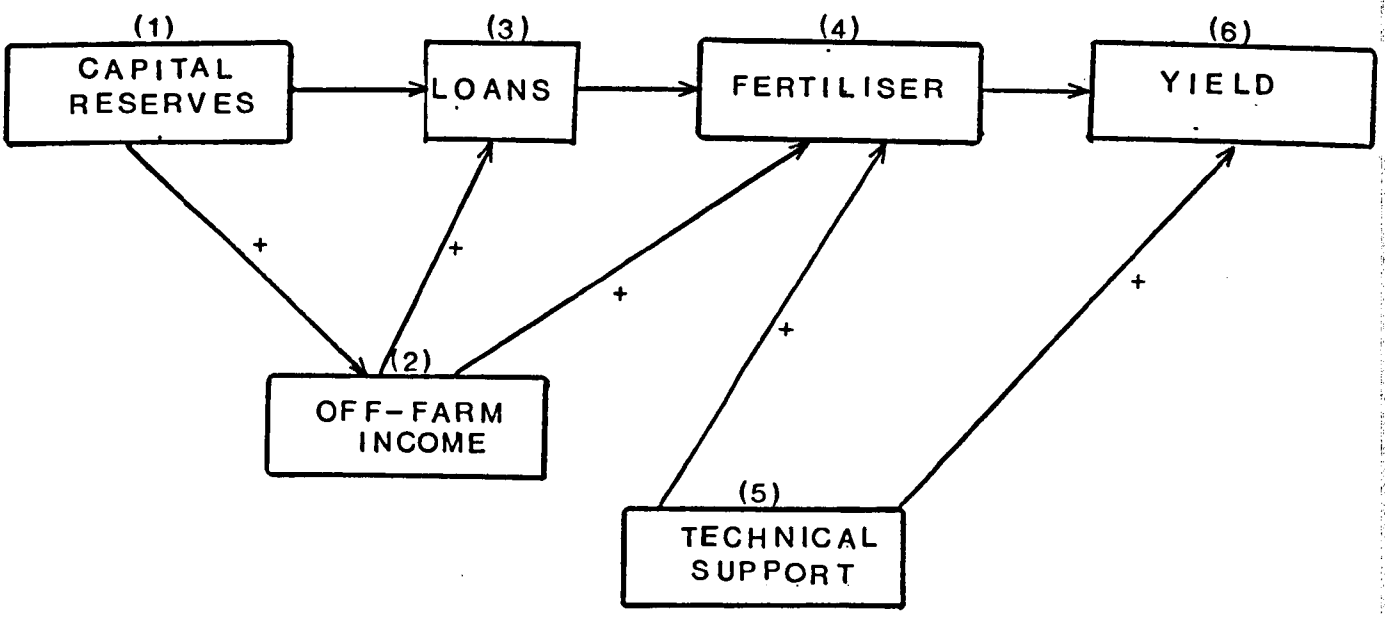
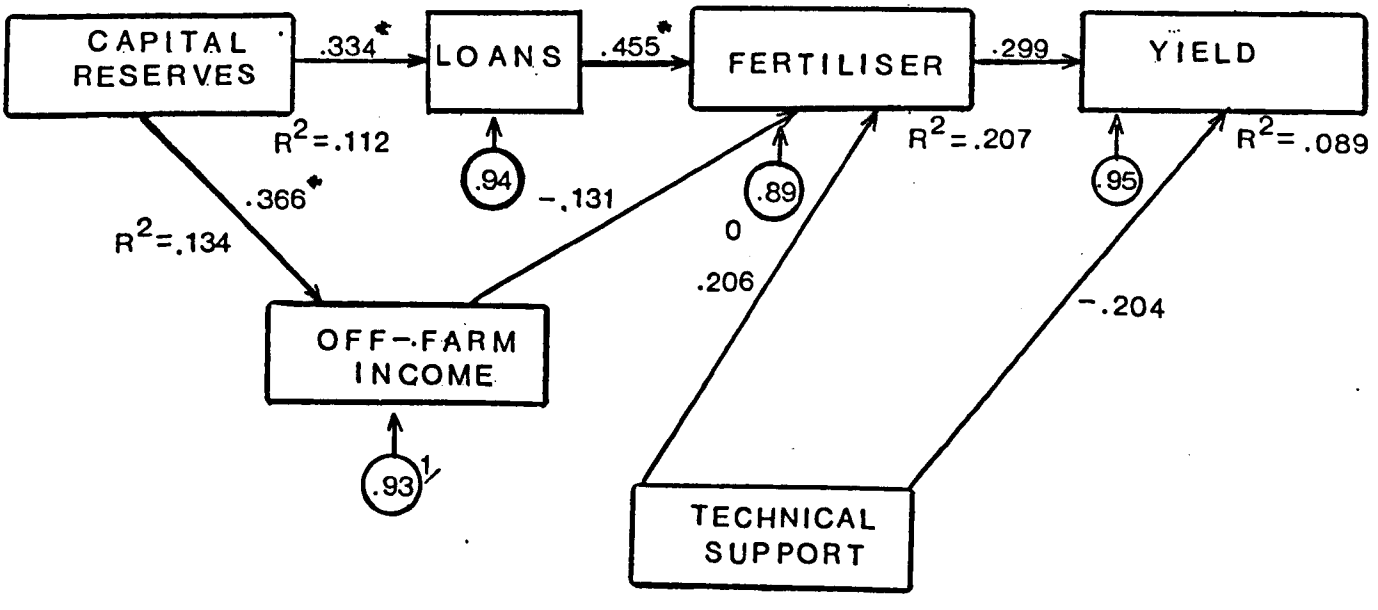


FIGURE 9.2 PATH DIAGRAM: WHOLE SAMPLE UBON (N=61)



1/ RESIDUAL PATH COEFFICIENT FOR EACH DEPENDENT VARIABLE $=\sqrt{1-R^2}$

* STATISTICALLY SIGNIFICANT

9.6 Summary and Recommendations

This chapter considered the agro-economic characteristics of a small sample of project farmers in Ubon and the relationships between credit, extension, use of fertiliser and production for the 1989/90 crop year. The farmers were all new to the project in FY1989, drawn from a specific target group who were considered to be "small-scale" according to the project definition. All had all received project loans for rainfed main crop paddy production.

The main assumption behind the model is that the total amount of farm inputs a farmer can use depends on the availability of capital. As for the small-scale farmers in Nong Noi (section 7.5.6), this assumption was supported by the analysis in that production loans had a positive and direct effect on the quantity of fertiliser applied. However the crucial relationship between input use and yield, though positive was weaker than expected, just failing to attain statistical significance. Clearly fertiliser was only one of several variables affecting paddy yields in the year under study. Various factors, beyond the control of the project, including environmental factors such as the availability of water, susceptibility to pests and diseases and the condition of the soil, had a profound effect on yield regardless of the amount of fertiliser used.

The variable of most interest in the analysis was that of technical support, a measure of the degree of contact between DoAE and BAAC field officers and project farmers during the main crop season. Although the level of technical support did have a positive influence on the amount of fertiliser used, the relationship was weaker than for loans, and there was no statistically meaningful relationship between technical support and yield, measured as the value of production per rai. Assuming that frequency of farmer contact is a reasonable indicator of the effectiveness of extension support, the results suggest that although working relations between the two implementing agencies did improve in year three (see section 8.8), it was not to a level sufficient to be reflected in farm-level performance. The computed model raises questions as to a) whether the advice given was technically correct and

appropriate for the local conditions[1] and b) whether the farmers were willing and able to act upon the advice given.

Due to the manner in which the models were specified, direct comparisons between the "credit-only" model tested in Chapter VII and the "credit-extension" model cannot be made. However, the results of the study for small-scale farmers Nong Noi (sections 7.5.6) and for the two rainfed districts in Ubon province allow some recommendations to be made which may inform and guide future policy planning for small farmer credit schemes. Firstly, for the small-scale farmers in Nong Noi, Traganpeutpon and Amnat Charoen, the amount of working capital reserves at the start of the year appears to be a major controlling factor on the amount they were able to borrow for production purposes. Since ability to save appears to be an important consideration in extending loans to potentially-viable farmers, encouraging such farmers to save, and using accumulated savings[2] as a pre-requisite for loan access, would be one means by which the Bank could increase lending to this group and enhance its effectiveness as a development agency in the rural areas. Innovative ways to encourage savings among small-scale farmers should be developed and integrated into the project design, regardless as to whether participating farmers actually take loans or not. Such a linked savings and credit approach, would also increase the confidence of branch managers in lending to poorer farmers. The effectiveness of the project could be further improved through offering participating farmers access to medium-term loans to finance alternative income-generating activities such as fish ponds, small livestock and non-farm activities including various types of cottage industry.

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1. The lack of "area-specific" recommendations used in the Thai extension system is discussed by Pakdee (1983). The problems of applying "blanket" recommendations were discussed at the province-level review seminars held from December 1989 to March 1990.

2. Once the balance has passed a certain minimal level.

Secondly, although in Ubon the influence of technical support on farmers' use of improved inputs is still limited, the association is nevertheless positive and may be expected to strengthen over time as the working relationship between the two agencies improves. Every effort should be made by the Central Coordinating Committee to bring the two agencies closer together through joint field visits for monitoring and evaluation and supervision purposes, "refresher" training for staff at all levels, but particularly for those working directly with farmers, and the introduction of various types of incentives. The latter is of crucial importance if the project's goals with regard to coordinated service provision to release the productive potential of the small farm sector are to be realised.

CHAPTER X

CASE STUDY 3 - LONG-TERM LENDING WITHIN THE PROJECT FRAMEWORK, LOEI PROVINCE

10.1 Introduction

Short-term loans to cover seasonal production expenses may act as a catalyst to change by enabling greater use of yield-increasing inputs and labour. However the results of such investments, even where accompanied with extension support, are likely to be limited. Although loans may be associated with incremental improvements in yields, more commonly, they simply allow for a continuation of farming patterns along traditional and well established lines. Given the generally unfavourable farming conditions in the Northeastern region in particular, it is unrealistic to expect that short-term loans will have a marked impact on the productive capacity of the farm in the longer term. In recognition of this, since 1976 BAAC has offered a long-term loan facility which allows borrowers to undertake more substantial farm developments such as financing the purchase of farm machinery, livestock, or the start up of new enterprises such as dairying or inland fishery or fruit farming or to undertake irrigation or land improvements.

The objective of this chapter is to provide an introduction to the project lending model employed by the BAAC under Sub-Project Two, the "Special Investment Projects" of the Northeast Poor Farmers' Scheme (see section 8.2.1). The chapter discusses BAAC's term lending activities, the role of projects in development and the methods BAAC employs in project formulation and analysis. The chapter then focuses on progress and constraints in implementing the Fruit Trees and Bamboo Project in Loei province, Northeast Thailand, the case study used for an analysis of the effectiveness of long-term loans extended within the project format.

10.2 BAAC's Term Lending

BAAC disburses long-term loans in two ways a) as individual loans; and b) within the project framework, in which other government departments, mainly from within the Ministry of Agriculture and Cooperatives (MOAC) may be involved in a supporting role. Individual long-term loans can vary in size up to one million baht and are repayable, depending on the type of activity undertaken, over a period of 5 to 15 years. Since the late 1970s the main source of funds for both types of long-term lending has been overseas donors including the World Bank, the Asian Development Bank (ADB), the Japanese Overseas Cooperation Fund (OECF), IFAD, the EC and the German development agency Kreditanstalt fur Wiederaufbau German (KfW). Overseas loans usually carry a lower interest rate than that charged on domestic borrowings and therefore help bring down the overall cost of funds for the whole operation (see section 4.6.8).

10.2.1 Individual loans

Long-term loans are disbursed to individual client farmers based on an analysis of the viability of the proposed enterprise carried out by the BAAC branch concerned, while for loan applications exceeding 1 million baht, the Projects Development Division (PDD) at BAAC's Head Office, conducts an independent appraisal. The loans are usually secured by the mortgage of assets and the borrower has to pay up to 25 per cent of the investment cost from his or her own funds. Once a loan has been disbursed, the borrower is entirely responsible for implementing the investment plan. With this type of loan, neither the BAAC nor any other government agency is obliged to provide technical support, which has to be sought by the farmer himself. For these reasons farmers qualifying for long-term loans are usually among the most progressive and financially-secure in the village community. As discussed in section 4.6.4, the repayment rate on this type of loan is not as high as for short-term loans, despite the perceived higher level of credit-worthiness among borrowers.

Restrictions

In order to direct their funds for developmental purposes, donor agencies including the CEC usually specify the target group for lending and the uses to which loans can be put. For example loans disbursed under Sub-Project 3 of the Northeast Poor Farmers' Scheme may not exceed 30,000 baht and are restricted to farmers in the Northeastern region. The loan-size limitation is intended to screen out larger-scale farmers for whom it is assumed the amounts available would be too restrictive. Under the first KfW loan, agricultural machinery loans of not more than 30,000 baht were restricted to farmers in the Northern, Northeastern and Southern regions with an annual net cash farm income of not more than 20,000 baht. The OECF loans, of which there were eleven between 1980 and 1991, have been directed towards certain crops and items of farm machinery, especially Japanese brands of power tiller.

10.2.2 Special projects

The BAAC has been disbursing long-term investment loans within the framework of area-specific projects since the late 1970s. It was at this time that external lending agencies became more overtly concerned about the qualitative or developmental impact of their loans in addition to repayment performance. Loans were thus targeted at increasing the productive capacity of certain "types" of farmers in certain locations and socio-economic groups (Padmanabhan, 1987) and monitoring and evaluation of the developmental effects of loans became important. It also became usual to ear-mark at least part of the total loan proceeds for "project lending". In the case of the first World Bank loan to BAAC (1980-81), the activities to be financed included dairy and shrimp farming, land reform and land consolidation schemes. Staff from the PDD were required to formulate viable development projects around specified activities in order to absorb the available funding[1].

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1. An account of the highly variable performance of these projects is given in the "First Agricultural Credit Project Completion Report, Loan No. 1816-TH," BAAC, May 1985.

Project definition

According to BAAC's conventions, a "special project" is aimed at a particular group of farmers in a defined area where local conditions require that some exception be made to the Bank's normal lending criteria and procedures, particularly with regard to loan security. For example the collateral requirements on land may be waived where the project is taking place in a reserve forest or in a land reform area, or the farmer's equity contribution may be reduced. By the end of FY1989, the BAAC had extended credit to 221 agricultural development projects which may be categorised as follows:

1. Credit projects implemented in response to policy directives from government (15 projects);
2. Integrated projects involving government agencies, private sector companies and the BAAC (61 projects);
3. Special agricultural development projects (145 projects).

Within the 117 "special projects" (category 3 above) implemented before FY1989, a total of 1,594.05 million baht was disbursed to 39,029 participating farmers. As for the 28 projects which commenced in FY1989, a total of 227.48 million baht was disbursed which constituted five per cent of total disbursement for long-term investment in agriculture. Long-term lending constituted 16 per cent of total disbursement in FY1989 (BAAC Annual Report, 1989). Planning projects for funding under the EC Northeast Poor Farmers' Scheme was one of the main activities of the PDD from 1987-1990.

10.3 The Project Framework

Projects have been the primary means through which governments of developing countries attempt to translate development plans and policies into prioritised programmes of action (Rondinelli, 1983). Hirschman (1967, p.1) refers to projects as "privileged particles of the development process", while Gittinger (1982, p.3) sees them as the "cutting edge" of development. In the agricultural sector, projects can incorporate a wide range of investment activities from rural credit to land settlement and may be broadly defined as activities for

which:

> "Money will be spent in expectation of returns and which logically seems to lend itself to planning, financing, and implementing as a unit" (Gittinger, 1982, p.5).

The project framework allows for resources and services to be channelled in a particular sequence, towards particular groups of people in particular areas in order to achieve specific objectives.

Advantages of the project format

The project format offers a number of advantages as a planning tool. Agricultural projects may be thought of as "bounded entities" restricted in time, location and target group, providing a framework for assembling and analysing information gathered from a wide range of sources both formal and informal. In order to analyse project feasibility, the cost and income data for each activity are arranged year by year, which enables the participating agencies to plan the phasing of inputs both material and financial over the project life. Where the data accurately reflect the full implications and extent of the planned intervention, project analysis can indicate the costs and benefits likely to accrue to participants at various levels, ranging from the donor agency and recipient government, through the implementing agency, down to the farm level. From the farmers' point of view, it allows an assessment of how he or she is likely to benefit from participating in the project intervention compared to what would have been earned if they had not taken part. The method also provides criteria against which to monitor and evaluate project performance (Gittinger, 1982).

Disadvantages of the project framework

The quality of project analysis however is only as good as the accuracy of the model specification, the data used to calibrate it and the reliability of the assumptions used. As Gittinger (1982) points out, the capacity of governments to prepare and analyse projects properly is often limited in many developing countries. Moreover, external project preparation missions working to strict deadlines, may fail to understand the full complexities of the local situation. In the effort to

disburse funds quickly, there is a tendency to impose a "blue-print" for implementation, using project designs proved successful elsewhere, which may not be fully in line with the development needs of the local people (Korten, 1980)[1]. Under-researched and poorly designed projects are often the result.

Projects are implemented within an environment where there are many uncontrollable variables at work. Successful projects leading to improved productive capacity and incomes depend on timely delivery of inputs and the completion of construction work, fair pricing policies for inputs and outputs, secure markets, favourable weather conditions, active participation and strong management. Planners therefore also need to incorporate a reasonable assessment of the risk[2] and uncertainty[3] associated with the project so that physical and price contingencies may be included to cover unforeseen circumstances (Gittinger, 1982)

Despite the technical, economic, social and institutional limitations of the project format, projects remain the most important vehicle for investing the resources of governments and international assistance agencies in the rural sector. The procedure for project development employed by the BAAC is described below.

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1. Korten (1980) points out that there is a need for greater emphasis on the "process" approach to project design and development as opposed to the top-down "blue-print" approach which often fails to ensure a close "fit" between the felt development needs of the local people and the capacity of the service insitutions to supply inputs and support services during the implementation phase (Korten, 1980).

2. Risk is a situation in which the probability distribution of a variable is known but the value is not. Therefore the analyst would know the probability of each of a range of prices occuring but not what the price is actually going to be. Risk analysis is concerned with estimating the probability of a range of alternative outcomes and assessing the acceptability of this probability of occurance (Gittinger, 1982).

3. Uncertainty may be defined as a situation regarding a variable in which neither its probability distribution nor its actual value is known. Sensitivity analysis enables the testing of the impact of likely variation in the project plan. It involves consideration and analysis of the effects of possible changes in any of the key variables which may affect the project outcome (Gittinger, 1982).

10.4 BAAC - The Project Cycle

Although financing of long-term loans within the special project framework constitutes only a small percentage of the total lending, a large proportion of the BAAC's time and manpower resources are devoted to project formulation. The Projects Development Division (PDD) comprises about 30 full-time staff and is responsible for identifying and preparing and appraising special projects[1]. The following discussion relates to BAAC's involvement in project lending within the public sphere only[2].

10.4.2 Identification

Special projects are identified in a number of different ways. In some cases ideas for projects are reported to the BAAC Head Office by branch staff who see an opportunity for productive investment in a particular activity within their administrative area. In other cases a project idea may be referred to the BAAC from another government agency usually from within the MOAC. In most cases however it is PDD staff who identify projects in different areas of the country and are responsible for carrying out the first two stages in the project cycle preparation and appraisal.

10.4.3 Preparation and appraisal - the project document

In whatever way a project is identified, project officers from the PDD must carry out an analysis of the feasibility of the proposed investment. This involves visiting the project area, and in liaison with other MOAC departments likely to be involved, collecting data from various sources, primary and secondary, to put together a project for financing within the context of a project document. This document gives a justification for the project including the objectives of the proposed intervention, the activities through which they are to be achieved and specifies the responsibilities of each of the participating agencies. Detailed

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1. Gittinger (1982) identified five stages in the project cycle namely: identification, preparation and analysis, appraisal, implementation and evaluation, to which may be added a sixth aspect, namely monitoring and evaluation.

2. BAAC has also been involved in special projects formulated in collaboration with private sector companies.

enterprise budgets for the project investment are drawn up showing the level and timing of input application in both physical and financial terms, the phasing of loan disbursement, expected outputs, repayment schedules, and cash-flow analysis indicating the expected returns to the investment. Once a draft document has been prepared and appraised, it is circulated to each of the concerned agencies for additional input and comment before a final draft version is put to the participating agencies for signature. The final document for each project, whether funded from the Bank's own resources or an overseas agency, is then presented to the BAAC's Board of Directors for approval. In the case of projects under the Northeast Poor Farmers' Scheme, approval also had to be obtained from the EC Delegation in Bangkok before funds could be drawn down from the Revolving Fund to meet the long-term credit needs of the participating farmers.

10.4.4 Implementation and administration

Once a project has been passed by the Board of Directors, responsibility for implementation is passed to the Loan Division[1] concerned, which supervises the particular branch responsible for implementing the project. The recruitment and disbursement targets for each project are built into the annual Branch Evaluation Procedure (see section 5.2.7).

In most cases a provincial committee is formed to oversee and guide implementation of each project. The committees usually comprise representatives from each of the involved agencies including the farmer participants, with the BAAC branch manager or loan division manager as chairman. The committees are normally scheduled to meet on a monthly basis to discuss progress and problems in implementation and to take corrective measures as necessary. The committee system, when operated correctly, is a potentially powerful tool for guiding the implementation path. In some cases the committees do function as intended, but more often, due to the difficulties of bringing members together at the same time and lack of perceived matters for discussion, they tend to meet infrequently, leaving the power of decision-making on day to day matters largely with the BAAC branch concerned.

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1. There is a separate loan division for each region of the country (see Figure 4.3).

10.4.5 Technical support

Due to the generally poor level of coordination between government agencies in Thailand (see section 8.5), providing adequate technical support and maintaining technical standards have proved to be the BAAC's greatest challenge in implementing special projects. While there have been a number of successful projects, there have been many cases where, as a result of inadequate research and non-availability of specialist advice, projects have failed to achieve their objectives. One such example is that of the EEC-funded Inland Fisheries Project in Mahasarakham province, located in a rainfed area, where on the advice of untrained credit officers, several ponds were incorrectly sited and did not receive sufficient rain water to enable farmers to raise enough income from fish production to repay their loans. Such basic planning errors prove difficult to correct later and may leave many farmers with the burden of having to repay large loans from sources other than those related to the investment[1].

10.5 BAAC's Approach to Project Analysis

Over the years, the Bank has developed a standard format for project analysis, the end result of which is a document which can be easily evaluated and serve as a reference manual for BAAC branches and other concerned agencies implementing a project. The procedure employed has been refined through experience to include sufficient data to meet the requirements for a financing decision to be made by the Board of Directors as quickly and as efficiently as possible. In other words, on the assumption that the technical specifications are correct, the analysis is geared towards demonstrating the expected **financial viability** of the project from the point of view of BAAC as the lending agency, so as to obtain approval for the release of funds.

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1. More generally, under Sub-Project 2 of the Northeast Poor Farmers' Scheme, income levels for projects which had achieved some production by the end of FY1989, varied widely in relation to the forecasts made in the project documents, from 25 per cent of the expected level in the Mahasarakham fisheries project to 124 percent in the Chaiyaphum sericulture project (BAAC, 1990).

The Bank has adopted a top-down, "blue-print" approach to project development and analysis, which suffers from a number of methodological weaknesses when viewed from the perspective of the intended beneficiary farmers. Firstly, the PDD staff rely heavily on secondary data and brief field visits and conducting informal discussions with farmers and concerned government agencies, to establish the suitability of an area for a particular project intervention, the technical viability of the project concept and the expected level of farmer receptivity. Generally no baseline studies are carried out. The project documents are then drawn up by bankers and economists for whom in most cases, technical knowledge has been accumulated through experience rather than through specialist training. Project implementation and the co-ordination of necessary support services from other concerned agencies is mainly the responsibility of the long-term loan officer at the branch concerned.

10.5.1 Appraisal techniques

As of the end of FY1990, it was not part of BAAC's normal project planning procedure to carry out a formal baseline study for each project which would establish the "without project" situation of the target farmers, and enable measurement of a) the opportunity costs[1] of project participation; and b) the likely incremental financial benefits of participation from the borrower's point of view. While considered suitable to establish the internal financial viability of the investment from the Bank's point of view, the method employed displayed a number of weaknesses which rendered it incompatible with internationally recognised techniques and indicators as follows:

1) Calculation of the financial indicators for the project documents was based solely on the "with project" situation at the farm level; in other words it did not allow for measures of incremental change, opportunity costs or returns at the farm level, but only of the expected financial return on the investment **before** loan repayment obligations had been met.

2) The analysis was "partial" in the sense that it focused on the investment in isolation from the rest of the farming operation. No attempt was made to represent the investment within the context of all the other activities taking place on the farm, that is within the "whole farm" situation.

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1. The benefit foregone by diverting scarce resources from one purpose to another (Gittinger, 1982).

3) The financial indicators were calculated over the repayment period of the loan rather than over the life of the project, for example 25 years in the case of perennial trees.

A further weakness of the project planning procedure as operated by BAAC up to 1990, was the absence of a formal connection between the MOE Unit and the PDD during the project preparation/appraisal stage. Since projects were developed without baselines studies, it was very difficult for the MOE Unit to develop an adequate "without-project profile" for the farmers and thereby construct indicators against which to measure incremental change in association with the project intervention. Monitoring and on-going evaluation activity only became important once implementation had begun. The implications of BAAC's approach to project analysis in relation to the small farm sector are analysed in Chapter XI.

10.5.2 Monitoring and on-going evaluation (MOE)

The MOE team for Sub-Project 2 of the Northeast Poor Farmers Scheme comprised three members of staff from BAAC's MOE Unit at Head Office. Members of the team visited each project under Sub-Project 2 on a quarterly basis, and reports documenting progress, problems and constraints were submitted to the appropriate divisional staff at the BAAC for further action. The branches also sent information on recruitment and disbursement measured against targets to the MOE Unit every month which were accumulated quarterly[1]. For projects implemented under EC funding, an annual evaluation study was carried out to meet the reporting requirements of the EC Delegation and to inform the CCC and concerned BAAC and DoAE officials.

In the third year of the evaluation study, in addition to household surveys conducted within a number of representative project types, groups of farmers who had joined the various projects in 1987 were called together in informal meetings to discuss their views on

1. However any discussion of implementation problems normally took place within the Loan Department only. There was little feedback to the Planning Department which could have helped institutional learning and guided future project designs.

project implementation, progress and constraints and any concerns they may have had about the projects' future. This approach was adopted to try to gain deeper insights into farmers' concerns than can normally be obtained through a formal questionnaire survey.

In the remainder of this chapter and in Chapter XI, the results obtained from MOE activities carried out in relation to the Fruit Trees and Bamboo Project in Loei province are used to assess the effectiveness of the project lending instrument as a means to increase the productivity capacity of small-scale farmers. To provide background to the technical analysis in the next chapter, the following sections discuss progress and problems in implementing the Loei project over the three-year period 1987/88 to 1989/90.

10.6 The Small Farmers' Special Investment Projects (Sub-Project 2)

The objective of Sub-Project 2 was to develop a number of special investment projects within the Northeastern region for the benefit of small-scale farmers who would not ordinarily qualify for long-term loans. The income qualifying criteria differed from project to project due to the substantial variations in loan size by project type. The projects all involved loan disbursement for both short-term and long-term purposes, although only the long-term element was allocated from the EC Revolving Fund. BAAC initially agreed that long-term loans provided under this Sub-Project would carry an interest charge of 9.8 per cent compared with the normal rate of 11.5 per cent. The rate was subsequently reduced to nine per cent to be in line with long-term lending for other externally funded projects in the Northeastern region. Repayment was scheduled to take place throughout the outstanding loan period with the exception of any grace period allocated.

As of the end of FY1989, this component of the Northeast Poor Farmers' Scheme covered 21 separate projects which may be classified by investment activity as follows:

- Tree planting (fruit trees, cashew and kapok)
- Freshwater fisheries
- Dairy enterprises
- Integrated poultry and fisheries
- Sericulture

It was expected that 98.87 million baht would be disbursed for Sub-Project 2 projects between FYs1987 and 1993.

10.7 The Fruit Trees and Bamboo Project, Loei Province

10.7.1 Background, objectives and targets

The Fruit Trees and Bamboo Project is operational in ten districts of Loei province and was the first of the special projects under Sub-Project 2 to be approved by the BAAC Board and the EC Delegation. Consequently implementation is further advanced than in other provinces implementing the same project design, namely Nakon Ratchasima (Korat), Chaiyaphum and Buriram. The target area for FY1987 was 3,000 rai with extensions of 2,000 rai in FYs1988 and 1989. A total of 1,562 farmers joined the project between FYs 1987 and 1989 and planted a total of 8,823 rai of fruit trees. By the end of FY1989, 98 per cent of the combined recruitment target had been achieved and the planted area target had been exceeded by 10 per cent. The general status of the project as of the end of FY1989 is shown in Table 10.1.

Table 10.1: Financial Status of Fruit Tree and Bamboo Projects Financed under Sub-Project 2 as of 31 December 1989
(million baht)

	TARGET				ACTUAL			
Project	Farmers	Area	Short term	Long term	Farmers	Area	Short term	Long term
Loei 87/88	400	2000	20.329	8.602	443	2458	.034	4.273
Loei 88/89	600	3000	21.600	8.976	703	4014	.000	5.590
Loei 89/90	600	3000	24.019	10.320	416	2351	.000	3.172
Buriram	600	3000	17.814	7.469	287	1367	.000	1.805
Korat	600	3000	16.835	6.932	161	1037	.000	1.292
Chaiyaphum	400	2000	10.947	4.799	328	2910	.000	3.118
Total	3200	16000	111.544	47.125	2338	14137	.034	19.110

Source: BAAC records.

The objective of the project is to develop mango, lychee, sweet tamarind, jackfruit and bamboo shoots either as a mono-crop or as a mixed crop on plots of about five rai per farmer. The project is located in reserve forest areas of the province. Other participating

agencies named in the project document include the DoAE, the RFD and the LDD. In FYs 1987-89 planting material was provided by the local nursery Racha Kaset following inspection and approval by the project management committee. Other inputs were supplied through BAAC's credit in kind programme.

Although some farmers continued to inter-crop fruit trees with maize, inter-cropping with red beans, black beans, peanuts or other suitable annual crops was recommended for the period prior to production (3-4 years). Plots averaged five rai with 25 trees planted per rai. Initial investigation of the marketing situation in Loei province by BAAC suggested that the output from the project could be absorbed by local markets. However unforeseen rapid expansion in years two and three indicated the need for the participating agencies to take specific steps to find a secure marketing outlet (section 10.8.9) before production came on stream. The average long-term loan amount available per farmer was 15,500 baht with supporting short-term loans. The project document anticipated that farmers registering for the project in forest areas would have a total holding size of about 46 rai, which was considerably above the mean provincial farm-size for Loei of 27 rai at the time of project commencement (OAE, 1986/7).

Table 10.2 shows the progress of the project in terms of areas planted to different types of fruit by district and by phase from FYs 1987-1989.

The following section gives an account of the progress and main problems encountered in implementing this project from 1987/88 to 1098/90. The account is based on monitoring activities carried out during this period involving discussions with involved officials from BAAC, DoAE, DoA, Racha Kaset, the Growers' Association and participating farmers.

Table 10.2: No. of Farmers and Area Under Different Fruits by District and Phase, Loei Fruit Tree Project

District	Phase	No.farmers	Sweet tamarind	Mango	Longan	Lychees	Jackfruit	Bamboo	Total
Muang	1	129	281	335	-	-	56	57	729
	2	85	381	-	-	-	23	60	464
	3	39	229	-	-	-	-	-	229
	Total	253	891	335	-	-	79	117	1422
Wangsapung	1	100	295	89	7	7	16	73	487
	2	134	490	43	69	8	-	136	746
	3	65	336	30	3	3	7	5	384
	Total	319	1121	162	79	18	23	214	1617
Phukradung	2	49	137	122	-	-	5	58	322
	3	63	99	234	18	2	11	-	364
	Total	112	236	356	18	2	16	58	686
Chiengkhan	2	43	215	16	5	-	-	-	236
	3	35	154	30	-	-	-	-	184
	Total	78	369	46	5	-	-	-	420
Pakchom	1	14	-	54	-	-	-	-	54
	2	70	227	14	35	45	6	84	411
	3	52	167	39	61	-	-	-	267
	Total	136	394	107	96	45	6	84	732
Thali	2	115	581	21	-	-	-	45	647
	Total	115	581	21	-	-	-	45	647
Phurua	1	98	259	73	252	13	-	-	597
	2	39	64	2	7	8	5	108	194
	3	37	2	67	49	51	37	-	206
	Total	174	325	142	308	72	42	108	997
Dansai	1	84	141	224	25	47	67	34	538
	2	98	303	123	13	10	70	55	574
	3	23	32	27	6	-	4	54	123
	Total	205	476	374	44	57	191	143	1235
Naduang	1	18	-	43	10	-	-	-	53
	2	51	218	20	28	-	-	40	306
	3	45	97	88	17	8	22	38	270
	Total	114	315	151	55	8	22	78	629
Nahew	2	19	34	37	-	10	33	-	114
	3	5	-	6	-	-	7	-	13
	Total	24	34	43	-	10	40	-	127
Phuluang	3	52	101	173	-	-	8	-	282
	Total	52	101	173	-	-	8	-	282

Source: BAAC branch, Loei.

10.8 Summary of Progress and Problems

This project is the first attempt in Loei to promote small-scale plantations of fruit trees as opposed to larger-scale operations. The majority of project participants planted fruit trees to replace upland crops particularly maize for which the price had been very unstable in recent years. There was considerable local interest and expertise on tree crop development within both the DoAE and the DoA. Not all farmers who applied to join the project had legal title to the forest land they cultivated. However the situation was considered stable enough that the branch manager was willing to extend loans against a letter from the Forestry Department stating that the certificates were to be issued in due course.

10.8.1 Recruitment and disbursement

Although farmer recruitment exceeded the targets in phases one and two, loan disbursement was considerably below target (Table 10.1). This was due to the fact that many participating farmers chose not to borrow to buy sprayers, water-pumps or other equipment originally included in the loan packages. In fact after year one, many farmers stopped taking long-term loans under the project altogether, preferring, despite the higher interest charge of 12.5 per cent to take out short-term loans to cover the cost of fertiliser and pesticide only. This enabled deliveries of fertiliser for all purposes including paddy, maize and fruit trees to be made to the village once per year only.

10.8.2 Seedling quality

The project in Loei was fortunate in having access to planting material from the local company Racha Kaset. DoAE took responsibility for validating the quality of the planting material, while BAAC arranged for its purchase and delivery to project farmers. According to the assistant provincial agricultural extension officer, chairman of the seedling inspection committee, the quality of the seedlings for the 1989 plantings was better than in 1987 or 1988. In 1987 the seedlings were delivered late and the mango varieties were of poor quality. Moreover, in 1988 the branch under-estimated the demand for certain types of tree resulting in some farmers being unable to plant the specified number per rai. For the 1989/90 crop year, farmers were surveyed well in advance on the varieties they wanted for the following

year and orders were placed early. There were also cases of seedlings being damaged during transportation and farmers failing to take care of the trees properly before planting. Planting too late in the rainy season[1] also caused high seedling losses in Buriram, Chaiyaphum and Nakon Ratchasima[2]. In FY1989 the company made an agreement with the BAAC not to deliver seedlings to farmers after 25 August each year so as to prevent seedling losses caused by late planting.

10.8.3 Input supply and usage

BAAC officers encouraged project farmers in both 1987 and 1988 to make use of commercially-prepared organic fertiliser at a cost of 43.5 baht/50 kg. bag, which the project document had recommended should be applied at a rate of 5-6 kgs./tree (BAAC, 1987). An expert opinion sought in 1988 considered this type of fertiliser to be technically redundant however, and that it would be more economical for farmers to make greater use of on-farm cattle manure and crop residues for which the cost is negligible[3] (BAAC 1988). In 1990 most of the project farmers interviewed in Wangsapung district had bought organic fertiliser from buffalo owners at 10 baht/60 kg. bag, which had largely replaced the use of commercially-prepared organic fertiliser[4].

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1. The Racha Kaset company provided replacement seedlings free of charge to the project farmers. Seedling losses were in the region of five per cent per year (Loei branch records).

2. The project design was replicated in Chaiyaphum, Nakon Ratchasima and Buriram. In each case there was no source of high quality source of planting material available locally. Planting material which had to be transported long distances from neighbouring provinces, was of poor quality and the seedling inspection procedure failed to sufficiently protect farmers' interests.

3. In 1988 the general observation was made that the use of fertilisers for tree crops was not well understood by farmers or by the BAAC field staff implementing the project. The recommendation was made that the Project Development Division should revise and modify the fertiliser recommendations set out in the project documents so as to make greater use of manure. Further promotion of the use of commercial organic fertiliser was discouraged (BAAC, 1988).

4. In year one project farmers had used three different types of fertiliser on the fruit trees, chemical, organic and manure; in year two chemical and organic; and in year three chemical fertiliser with manure.

A point of concern which recurred during the on-going evaluation was the under-utilisation of chemical fertiliser by project farmers (see sections 11.5.1 and 11.5.2) and the likely effect it would have on future yields. The provincial extension officer advised that fertiliser use in years one to three is largely to promote healthy root development and tree growth. However in the absence of research results, it was not possible to generalise as to the likely effects of under-utilisation on future output[1].

10.8.4 Field maintenance

The project farmers were encouraged by both the BAAC staff and the Growers Association to carry out mulching around the base of the trees during the dry season to conserve soil moisture. This was also emphasised in the training courses and instructional materials provided by BAAC and the Provincial Growers' Association. Most of the farmers interviewed in Muang and Wangsapung districts had mulched on the advice of one of these agencies, although there was a perception among some borrowers that it would increase the risk of fire. The majority of farmers interviewed in Muang and Wangsapung had, however, not started pruning the trees, either because the trees were not sufficiently well developed, or they did not have the equipment or knowledge necessary to do the job correctly. Although the loan package did not include provision for pruning equipment, the BAAC offered a small loan facility for this purpose.

10.8.5 Inter-cropping and soil erosion

The project document recommended that farmers inter-crop with beans, preferably red or black or soybean during the first four years of tree development. In the first year most of the sampled farmers planted red or black beans and received a satisfactory return (BAAC, 1988). In 1988 and 1989 however, many different types of inter-crop were grown with fruit trees including maize, mungbean, cotton, soybeans and chilli. There were no technical reasons as to why these crops should not be grown as long as farmers paid careful attention to

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1. Once the trees are producing there is still a need to apply the recommended amounts of chemical and organic fertiliser to enhance yields from year to year.

spacing between the inter-crop and the fruit trees.

The farmers interviewed in Wangsapung district in February 1990 did not have problems with soil erosion because they had planted on level plots and the soil has been stabilised by inter-cropping over the previous three years. Erosion was a more serious problem in the drier, sandier parts of Wangsapung district where a number of farmers had planted on slopes. It was recommended that these farmers should build dikes across the fields to prevent the adverse effects of soil and water being washed downslope.

10.8.6 Water supplies and plant disease

Farmers interviewed in a drier part of Wangsapung district were concerned at the lack of water sources from which to irrigate the trees during the dry season. It was reported that many trees had been lost in the first two years of the project due to drought, which farmers had to replace at their own cost. In Wangsapung, lack of water was the most serious problem in implementing the project[1].

The second most serious problem facing the project farmers in both Wangsapung and Muang districts was disease, particularly yellowing and falling leaves, a white powdery substance developing on the branches and burrowing insects, which tended to be most prevalent at the start of the dry season[2]. Due to inadequate and infrequent technical advice from DoAE office (see section 10.8.7), project farmers were reportedly spraying the trees far more frequently than necessary as a preventative measure. The assistant agricultural extension officer suggested that increased vigilance and cautious use of pesticide would have been a lower-cost alternative.

10.8.7 Supervision

Extension meetings were held in the project areas on the fifth day of every month. However attendance was sporadic among the project farmers, largely because the

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1. One farmer with 10 rai of sweet tamarind trees reported losing 20 trees after planting in year one due to drought.

2. Four farmers reported having lost over 30 trees each as a result of mites.

information and advice given applied to a wide range of crops being promoted in the area, with no particular reference to fruit trees. The only specialist technical advice the project farmers received was from the Growers Association which provided instructional material free of charge, together with annual training courses to supplement that provided by the BAAC. In general, the project farmers received inadequate technical support particularly with respect to pest and disease control.

10.8.8 Training

In year one, all of the project participants received some basic training in growing fruit trees when they visited the BAAC branch to collect their first loan instalment. A short training session was conducted by representatives from the concerned line agencies including the BAAC, LDD, the DoA Research Station in Loei and the DoAE. Simple instructions were prepared by the BAAC Public Relations Division were also given to farmers for reference purposes.

By year two however, the number of project participants had grown to over 1,000 and the branch ran short of funds to provide training at the branch office. The branch manager therefore agreed to assist the DoAE in equipping a mobile training unit to visit farmers in different districts, set up exhibitions and generally provide information on fruit production. Despite this modest effort, there was a general loss of momentum in training in 1988. In year three, the branch requested additional funding from the Head Office to provide training to project farmers who were by this time widely scattered throughout the province. The branch and the Growers' Association, organised by the Ratcha Kaset company, arranged training for the 1989 planters in May of that year. The majority of farmers interviewed were however reluctant to attend the training because of transportation costs to the training centre in Loei town.

By year three the emphasis in training for the 1987 recruits had switched from issues concerning tree development to questions of quality control and marketing. The more interested and highly motivated farmers were encouraged to form Quality Control (QC) Groups. Based on a successful model developed by BAAC for fruit growers in the eastern

provinces of Rayong and Chantaburi, BAAC's Agri-Business Promotion Division was aiming to establish QC Groups among project farmers in Loei through which to provide training in premium quality fruit production, post-harvest treatments and marketing. BAAC and Ratcha Kaset were to assist the groups in arranging bulk purchase orders with exporters. Thirty farmer leaders from throughout the province were selected from among 80 applicants to attend the pre-establishment meeting for the first QC Group. Four groups, comprising 15 people were started in the first few months of 1990 and four more were to be established later in the year. The discussion groups held in Muang and Wangsapung in early 1990, emphasised the need for further reference material and "refresher" training for all project farmers, not only those belonging to QC groups.

10.8.9 Marketing

The first output from the project plots was expected in April 1990 for mango and from December 1990 onwards for sweet tamarind. The provincial authorities were taking an active interest in attracting fruit merchants to Loei through promotional fairs and seminars. Similarly the BAAC branch had been working with the Agri-Business Promotion Division and the Fruit Growers' Association to arrange marketing outlets for the project fruit. The main seedling supplier for the project, Racha Kaset was also involved in purchasing activities and the export of sweet tamarind. In 1990 there were approximately 40,000 rai under sweet tamarind in Loei and 10,000 rai under mango. The company considered the marketing prospects for these two crops to be very good both locally and overseas and had secured large orders for sweet tamarind from Canada, Australia, Taiwan and Singapore. Establishing the Growers' Association was one means to secure a reliable source of supply to meet such orders. To support the association, the company paid the registration fee for all project farmers and provided instructional material and technical advice to interested farmers. The company was also taking an active part in the establishment of QC Groups in association with BAAC to encourage farmers to improve output quality and post-harvest handling.

10.9 Summary and Conclusions

This chapter discussed the characteristics of BAAC's term lending programme, the advantages and disadvantages of the project format as a vehicle for investing funds in the rural sector and the general characteristics of BAAC's approach to project design and analysis. The Fruit Trees and Bamboo Project in Loei province was then introduced as the subject of the case study on long-term project loans, through a discussion of progress and problems in implementing the project during the period 1987/88 to 1989/90. In aggregate terms, the project progressed relatively well during this period; farmer recruitment and the planted area exceeded the set targets in FYs1987, 1988 and 1989 and there was potential for expansion by a further 2,000 rai in FY1990. Loan disbursement had however fallen behind target due to farmers' desire to minimise borrowing which was reflected in reduced fertiliser application in years two and three. There were also a number of outstanding field management issues including the need for improved inter-cropping practices and the necessity for all farmers to mulch and prune the trees and to take fire control measures in the dry season. Public institutional support to the project farmers was inadequate during the period under study due to the lack of specialist knowledge on fruit production among kaset tambons and insufficient attention being paid to seedling quality especially for mango and bamboo. Participating farmers also expressed the need for further training and marketing support, especially for those unlikely to be invited to join quality control groups. Against this background, the following chapter goes on to evaluate the impact of long-term loans disbursed under the Fruit Trees Project in Loei in terms of the likely financial returns to the farmer participants.

CHAPTER XI

THE "PROJECT LENDING" MODEL, LOEI PROVINCE

11.1 Objectives

Having discussed the progress of the Loei Fruit Trees and Bamboo Project in general terms, the objectives of this chapter are a) to describe the agro-economic characteristics of a panel of participating farmers; and b) to establish a framework within which to carry out an assessment of the effectiveness of the project in assisting small farmer development in Northeast Thailand using discounted cash-flow analysis (see section 2.6.1). Effectiveness in this context is measured as the return on the investment from the point of view of the farmer-borrowers.

11.2 Sampling and Data Sources

Data collection for the on-going evaluation was carried out among a panel of 32 purposively selected farmers in Wangsapung and Muang districts. The rationale for the use of purposive sampling within the case study context and for monitoring and evaluation is given in section 9.3.2. These districts were chosen on account of the large area planted to sweet tamarind and mango which were the most important of the tree crops grown among project farmers. The farmers were chosen, on the advice of the BAAC long-term loan officer responsible for implementing the project, to be representative of those who had invested in five rai plots of mango and sweet tamarind. Each year, evaluation data were collected, under supervision, by a small group of trained interviewers from the BAAC's MOE Unit. Two types of data were collected during the three year period; a) data pertaining to farmers' economic status and farming patterns prior to joining the project at the end of the 1986/7 crop year and again in 1987/8, after one full year of participation; and b) actual project-related investment and operating costs incurred during the first, second and third years of implementation, and any income accruing from the investment itself or from inter-cropping during this period. Data referring to the 1986/7 crop year are taken as representative of the whole farm "without-project" situation, while that collected at the end of the 1987 crop year, represent

the "with-project" situation. Within the context of the model, any changes in resource allocation between the two years, for example, changes in area planted to particular crops, reductions in whole-farm income levels including off-farm income, are assumed to have occurred in association with the project.

In summary, five sets of data are used to carry out the analysis:

1. April 1987 - survey of sampled farmers' economic status and resource allocation pertaining to the 1986/7 crop year, the year before the project started;

2. April 1988 - survey of farmers' economic status and resource allocation pertaining to the 1987/88 crop year, one year after the project started (excluding project plot);

3. April 1988 - survey of actual investment and operating costs for the project investment during crop year 1987/88 plus any income generated from the project plot during the first year;

4. May 1989 - survey of actual investment and operating costs for the project investment during crop year 1988/89 and any income generated from the project plot during the second year;

5. February 1990 - survey of actual investment and operating costs for the project investment during crop year 1989/90 and any income generated from the project plot during the third year.

11.3 Re-casting the Financial Models

In order to assess the impact of the project in terms of returns to the farmer, is necessary to re-cast the financial models given in the project document (BAAC, 1987). The partial "with project" only method of project analysis employed by BAAC, though considered sufficient for financial appraisal from a banker's point of view, is inadequate for assessing the extent to which a borrower is likely to benefit from taking a loan (see section 10.5). The analysis should take account of other income-generating activities taking place on the farm and the opportunity costs in terms of income lost through diverting land and labour resources into investment-related activities. In other words, the need is for an incremental analysis

over the life of the project as against simply the period of the loan[1], that will show the extent to which the farmer is likely to gain from the project, over and above what he or she would have earned by continuing the "without project" pattern of activities, after repayment obligations have been met. The steps involved in re-casting the financial models given in the BAAC project document into a form that will enable the financial viability of the investment and the returns to the farmer to be measured using discounted[2] cash-flow analysis are:

1. Re-establishing the project document models within a "whole farm" format[3], incorporating data on the net income "without" the project and income and expenditure figures for all project and non-project activities throughout the life of the project[4]. For the purposes of the analysis, net farm income "without" the project and income and expenditure from farm and non-farm activities "with" the project, but not related to the investment, are assumed to be at constant prices throughout the project life.

2. Substituting **actual** investment and production cost figures, on the same area basis, in years one, two and three for the estimates used in the project document models. The project document assumptions regarding expected prices and yields are retained for all future years.

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1. In fact re-casting the model over the estimated 20 year life of the fruit trees as against the nine years of the investment, does not make much difference to the financial indicators, as within discounted cash-flow analysis, the effects of any changes in the parameters of the model are most marked in the early years of the investment (Gittinger, 1982).

2. Discounting is the process of finding the present worth of a future amount of capital. The present worth is determined by multiplying the future amount by the expression $1/(1+i)n$ where i= the discount rate (interest rate) and n=the year. Generally this expression is obtained in the form of a discount factor, from a set of discounting tables (Gittinger, 1982)

3. Using SuperCalc 5 software.

4. According to the framework proposed by Gittinger (1982).

3. Calculating financial indicators to assess the incremental benefits of the investment from a financial perspective. The indicators used include the net present value[1], the financial internal rate of return[2], the benefit:cost ratio[3] and the net benefit increase[4], a measure of the extent to which a farmer's income is likely to increase in incremental terms once repayment obligations have been met.

The revised models are based on investment and operating costs for the two main types of fruit being grown under the project, mango and sweet tamarind on a five rai area basis. The only income accruing to the investment during the first three years was from inter-cropping. At the time of the third round of "with project" interviewing in February 1990, none of the panel farmers had derived any income from fruit trees. The first production was expected in mid to late 1990. Before going on to discuss the results of the revised models, the following section briefly describes the general agro-economic characteristics of the panel farmers.

11.4 General Characteristics of the Panel Farmers

To summarise the general features of the project farmers (Table 11.1), average farm-size, including land inside and outside the reserve forest was 46 rai compared to 27 rai for the province as a whole (OAE, 1987/88). Almost 60 per cent of the mean cultivated area was upland. The crops grown include glutinous rice, maize, red beans, black beans and groundnuts and a few farmers kept livestock. However the main crop in terms of area was maize, constituting between 40 and 50 per cent of the total farmed area. At the time of the surveys in 1986/87 and 1987/88, no cassava was being grown by the panel farmers. Rice and

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1. The project net present value is the present worth of the incremental net benefit stream or incremental cash-flow (Gittinger (1982).

2. The internal rate of return is that discount rate which brings the net present worth of the net benefit stream to zero. It therefore represents the maximum interest that a project could pay for the resources used if the project is to break even or the rate of return that a project must achieve to recover its investment and operating costs (Gittinger, 1982).

3. This is the ratio obtained when the present worth of the benefit stream is divided by the present worth of the cost stream (Gittiner, 1982).

4. This is the "present worth of the incremental net benefit stream **after** financing "with" the project, divided by the present worth of the incremental net benefit **after** financing "without" the project, expressed in percentage terms" (Gittinger, 1982, pp.140).

maize yields were considerably below the average for the province in 1987/88 at 210 kgs./rai and 201 kgs/rai for glutinous and non-glutinous rice compared to 380 kgs./rai for the province (OAE, 1987/88). The average maize yield of 313 kgs./rai in 1986/87 declined to 274 kgs./rai in 1987/88. This was attributable to the serious drought conditions which affected Loei and other Northeastern provinces during the 1987/88 crop year[1].

Income levels for the project farmers ranged between 26,214 baht and 23,206 baht compared with an average of 24,023 baht as measured for the Northeastern region by the OAE in 1987/88. Therefore, despite the larger average farm-size, the project farmers were fairly typical Northeastern farmers in terms of income. Over 60 per cent of total family income came from on-farm sources compared to 48 per cent for the region as a whole (OAE, 1987/88).

The majority of project farmers interviewed had substituted fruit trees for maize, which was reflected in the decline in the maize planted area from 23.28 rai to 18.75 rai during the period between surveys. This was in response to the very unstable maize price in preceding years and the provincial policy of vigorously promoting the alternative of fruit trees. Generally, the combination of inter-crops grown with the fruit trees changed from year to year, from red and black beans in year one to chilli in rotation with soybeans or cotton in year three (see sections 11.5.1.and 11.5.2). Nearly all of the farmers interviewed in Wangsapung district were growing sweet tamarind because of its greater resistance to drought[2]. The majority of interviewees said they would probably have started growing fruit trees even without the BAAC project, because of the need to diversify out of upland crops. They saw the main advantage of the project in being that it provided access to loans for fertiliser and pesticide as well as a degree of technical support and the possibility of a secure market.

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1. Reservations concerning the measurement of crop yields in surveys based on farmer recall are expressed in section 9.4.6.

2. Although most of the farmers were new to growing sweet tamarind, a few had started growing sweet tamarind before joining the project, using a variety from Petchabun.

Table 11.1 (a): Summary of Sampled Farmers Characteristics, Loei Fruit Trees Project Compared to OAE Figures, 1986/87 - 1987/88

	OAE	Sample
TOTAL FARM SIZE (rai)	27	46
RICELAND (%)	26	23
UPLAND (%)	66	59
OTHER (%)	8	18

MAIN CROPS (% of farmers)	1986/87	1987/88
Glut. rice	86	71
Non-glut.rice	11	18
Maize	71	64
Red beans	89	89
Black beans	18	39
Groundnuts	39	43
Livestock	11	21

MAIN CROPS (area planted in rai)		
Glut. rice	7.82	7.42
Non-glut.rice	.82	1.32
Maize	23.28	18.75
Red beans	7.17	7.17
Black beans	2.25	2.96
Groundnuts	1.96	1.89

YIELDS (kgs/rai)	PROVINCE	SAMPLE	
	1987/88*	1986/87	1987/88
Glutinous) rice)	380	289	210
Non-glut.)		117	201
Maize	307	313	274
Red beans	n/a	136	119
Black beans	n/a	22	45
Groundnuts	189	93	154

Source: Household Surveys; Agricultural Statistics of Thailand, Crop Year, 1988/89, OAE, 1989.

Table 11.1 (b): Summary of Income Levels and Sources, Comparing the Sample from the Loei Fruit Trees Project to OAE Figures (1988)

		Net farm income baht	%	Non-farm income baht	%	Total income baht	%
NORTHEAST (OAE)		11,494	48	12,529	52	24,023	100
SAMPLE	Before	16,672	64	9,542	36	26,214	100
	After	13,985	60	9,221	40	23,206	100

Sources: Household surveys; Agricultural Statistics of Thailand, Crop Year, 1988/89, OAE, 1989.

11.5 Financial Analysis

The financial analysis presented here focuses on the two main types of fruit tree grown under the project, namely mango and sweet tamarind. Table 11.2 presents a breakdown of the financial indicators for all five tree types given in the project document. The discount rate[1] used in calculating the indicators was 12.5 per cent which was the prevailing interest rate on long-term loans at the time of project preparation. As mentioned above, the interest rate was reduced to nine per cent during the early months of project implementation. However the more conservative figure of 12.5 per cent was retained in calculating the financial indicators shown below.

1. Equivalent to the opportunity cost of capital. The discount rate is primarily a measure of the opportunity cost of investment decision i.e when investing scarce resources, it represents the benefits or return that would have been gained in the next best alternative use. Gittinger (1982) exaplains that it is very difficult to estimate the opportunity cost of capital and for practical purposes most analysts use the prevailing rate of interest on loans as the discount factor.

Table 11.2: Estimated Financial Indicators for Mango and Sweet Tamarind for the Loei Fruit Tree Project According to the Project Document

	Mango	Sweet tamarind	Longan	Lychee	Jack-fruit
Net present value (NPV)(bt.)	16,149	38,718	10,113	12,433	17,661
Financial internal rate of return (FIRR)(%)	32.85	48.71	18.41	19.49	29.31
Benefit: cost ratio	1.67:1	2.36:1	1.14:1	1.18:1	1.68:1

Source: Fruit Trees and Bamboo Project, Loei Province, Projects Development Division, BAAC, 1987 (in Thai).

One of the most important points to emerge from each of the evaluation studies carried out for the project was that the panel farmers did not always follow technical specifications with regard to input use, nor borrow or incur costs for all of the recommended items. Among the panel of project farmers the actual amounts borrowed and spent were below the crop budgets estimated in the project document in all three years under study. This is discussed in detail for year three of the project in the following paragraphs. Actual expenditures in years one and two are given in Table 11. 5 and those for year three in Table 11.3.

11.5.1 Mango

Planning assumptions

The model elaborated in the project document for five rai of mango includes expenditure for chemical fertiliser, organic fertiliser, pesticide and insecticide in year three. Total investment was estimated to be 2,100 baht in the third year including a 100 baht contingency allowance (BAAC, 1987).

Survey results

According to the survey in year three, mango growers incurred costs for chemical fertiliser, organic fertiliser, pesticide, and insecticide. As in years one and two actual costs were considerably below those estimated in the project document, due to under-utilisation of

recommended inputs and reliance on family labour, as opposed to hiring labour. The following table summarises the financial aspects of the third year of project operations, in comparison with the assumptions included in the project document. All figures are on a five rai area basis.

Table 11.3: Actual Costs for Investment in Mango, Year Three

	SURVEY FINDINGS Mean for representative farmers (bt.)	PROJECT DOCUMENT (bt.)
MANGO		
Chemical fertiliser	295	750
Organic fertiliser	30	750
Insecticide/pesticide	275	500
TOTAL COSTS	600	2,000
INTER-CROP		
Seeds	-	
Pesticide	320	
Land preparation	600	
fertiliser	75	
Labour	600	
TOTAL OPERATING COSTS	1,595	1,260
TOTAL VALUE OF PRODUCTION	3,000	2,200

Sources: Household Survey; Project Document, BAAC, 1987.

With regard to fertiliser, the recommendation for chemical fertiliser use was 25 kgs./rai or 1 kg./tree in years one, two and three. Thus for a five rai plot the farmer was expected to use 150 kgs. of 15-15-15 at five baht/kg. costing 750 baht each year. In practice in year three the sampled farmers growing five rai of mango used about 10 kgs./rai or 50 kgs. for five rai, at a cost of 295 baht for 50 kgs. Average fertiliser application per tree in year three was about .40 kgs compared to .80 kgs. in year one and .66 kgs. in year two. The likely effect on yields of under-utilisation of chemical fertiliser to this degree has yet to be

determined. Data showing variation in yield response to different fertiliser applications were not available at the time of the survey. Fertiliser application in years one to four is necessary to assist root and trunk development and one the tree is bearing fruit, to encourage maximum yield. The gradual decline in fertiliser application among the panel farmers is therefore a disturbing trend which may have a detrimental effect on future potential. Reasons for the under-utilisation of chemical fertiliser among the panel farmers may include farmers' own understanding of the nutritional requirements of the land, the desire to reduce borrowing and the opportunity costs involved in using scarce operating capital to purchase chemical fertiliser for which the value of the marginal return is uncertain.

As for the use of manure, the DoAE recommendation was 6 kgs./tree in years one to four, amounting to 150 kgs./rai and 750 kgs. for five rai. The mango growers interviewed used manure at an average rate of about 7-8 kgs. per tree amounting to 188 kgs./rai and 938 kgs. for the entire area. The actual application rate in year three was therefore above the recommendation and in agronomic terms may have compensated to some degree for the under-utilisation of chemical fertiliser. There was a nominal charge of 10 baht/bag for buffalo manure available locally, although most farmers did not incur any cost for this. Rock phosphate, used by some farmers in years one and two to assist root development, was abandoned in year three.

All of the panel farmers purchased pesticide and/or insecticide in year three, at an average cost of 275 baht compared to the project document allowance of 500 baht. The survey showed that none of the panel mango growers incurred costs for labour during the third year. All labour for the investment was supplied by the farm-household. Calibrating the model with the actual cost data obtained by survey, total project-related expenditure for the first year of the project was 7,283 baht, 1,333 baht in the second year and 600 baht in the third year (Table 11.5).

Although the project document assumed participating farmers would produce an inter-crop of beans at a rate of 200, 100 and 50 kgs./year during the first three years of tree growth, no estimate of the derived income or the associated production costs were included

in the calculation of financial indicators. The household survey found that all of the panel farmers were growing an inter-crop in year three, mainly chilli. An average gross income of 3,000 baht was obtained from a five rai plot of inter-cropped chilli. Production costs covering land preparation, pesticide and fertiliser averaged 1,595 baht giving a net income of 1,405 baht.

Table 11.4, shows the a re-interpretation of the project document model based on a "with" and "without" project comparison. The whole model is given in Table 11.5. The data relating to the "without project" situation were obtained from the field survey among the panel farmers in 1986/7, one year before the project started. BAAC's estimates of cost outlays in years one, two and three contained in the project document have been replaced with actual costs derived from the survey data. Costs and income from inter-cropping of red and black beans in year one and various crops including maize, cotton and soybeans in year two and chilli in year three have been included. Income from non-farm sources "with" the project has also been included. The assumptions concerning expected prices and yields from year three onwards remain the same as in the project document. The loan amounts available in years one, two and three have been replaced by actual amounts spent on investment and operating costs and the scheduling of debt service adjusted accordingly.

Table 11.4: Financial Indicators Derived from Incremental Cash-Flow Analysis for a 5 rai plot of Mango

Project life:	20 years
Discount rate	12.5
Net present value	26,180
Financial IRR (%)	28.04
Net benefit increase (%)	12.46

Sources: Household Surveys and Project Document, BAAC, 1987 (in Thai).

This incremental assessment of the financial viability of the investment shows an reduction in the FIRR to 28 per cent and an incremental net benefit increase to the farmer after repayment obligations have been met, of 12.46 per cent.

TABLE 11.5: FARM BUDGET FOR FIVE RAI OF MANGO TREES, FRUIT TREES AND BAMBOO PROJECT, LOEI PROVINCE

PROJECT YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
INFLOWS																				
Gross value of production																				
Tree crop				8000	12000	14000	16000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
Inter-crop	2484	3052	3000																	
Other farm income	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130
Off-farm income	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221	9221
Total inflow	34835	35403	35351	40351	44351	46351	48351	52351	52351	52351	52351	52351	52351	52351	52351	52351	52351	52351	52351	52351
OUTFLOWS																				
Investment	7283	1333	600																	
Incremental working capital	870	1765	1595	3150	3650	4050	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250
Operating expenditures	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884	10884
Total outflow	19037	13982	13079	14034	14534	14934	16134	16134	16134	16134	16134	16134	16134	16134	16134	16134	16134	16134	16134	16134
NET BENEFIT BEFORE FINANCING																				
Total	15798	21421	22272	26317	29817	31417	32217	36217	36217	36217	36217	36217	36217	36217	36217	36217	36217	36217	36217	36217
Without project	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215
Incremental (negative)	-9417	-3794	-2943	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Incremental (positive)	0	0	0	1102	4602	6202	7002	11002	11002	11002	11002	11002	11002	11002	11002	11002	11002	11002	11002	11002
Incremental	-9417	-3794	-2943	1102	4602	6202	7002	11002	11002	11002	11002	11002	11002	11002	11002	11002	11002	11002	11002	11002
FINANCING																				
Loan receipts: LT	7283	1333	600																	
Loan receipts: ST	870	1765	1595	3150	3650	4050	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250
Debt service: LT	0	0	0	1940	3256	3903	2749	2829	2548	0	0	0	0	0	0	0	0	0	0	0
Debt service: ST	979	1986	1794	3544	4106	4556	5906	5906	5906	5906	5906	5906	5906	5906	5906	5906	5906	5906	5906	5906
Net financing	7174	1112	401	-2334	-3713	-4409	-3405	-3486	-3204	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656	-656
NET BENEFIT AFTER FINANCING																				
Total	22972	22533	22673	23983	26104	27008	28812	32731	33013	35561	35561	35561	35561	35561	35561	35561	35561	35561	35561	35561
Without project	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215	25215
Incremental	-2243	-2682	-2542	-1232	889	1793	3597	7516	7798	10346	10346	10346	10346	10346	10346	10346	10346	10346	10346	10346
CASH POSITION																				
Net benefit after financing	22972	22533	22673	23983	26104	27008	28812	32731	33013	35561	35561	35561	35561	35561	35561	35561	35561	35561	35561	35561
Home-consumed production																				
Cash surplus (deficit)	22972	22533	22673	23983	26104	27008	28812	32731	33013	35561	35561	35561	35561	35561	35561	35561	35561	35561	35561	35561

DURATION	20
Discount rate (%):	12.5
Net present value:	26180.85
Financial rate of return:	28.04
Net benefit increase:	12.46

SOURCE: Updated from table in Fox (1989)

11.5.2 Sweet tamarind

Planning assumptions

In the financial model for sweet tamarind as elaborated in the project document, the estimated investment cost for five rai of sweet tamarind in year three is 2,100 baht. The expected NPV for the project, at a discount rate of 12.5 per cent is 38,718 baht, the FIRR 48.71 per cent and the benefit:cost ratio 2.36:1.

Survey results

The main expenditure items allowed for in the project document for year three were for organic fertiliser, chemical fertiliser and pesticide. In year three the actual expenses incurred by growers with five rai plots were for chemical fertiliser and pesticide only. None of the panel farmers used organic fertiliser or hired any labour to work on the plots during the year. All labour was supplied from the farm-household (Table 11.6).

Table 11.6: Actual Production costs for Sweet Tamarind - Year Three

	SURVEY FINDINGS Mean for representative farmers (bt.)	PROJECT DOCUMENT (bt.)
Chemical fertiliser	295	750
Organic fertiliser	-	750
Insecticide	315	)500
Pesticide		)
TOTAL OPERATING COSTS	610	2,000
INTER-CROP		
Seeds	1,000	
Land preparation	75	
Labour	350	
fertiliser	120	
Pesticide	300	
TOTAL OPERATING COSTS	1,845	1,260
TOTAL VALUE OF PRODUCTION	3,900	2,200

Source: Household surveys and Project Document, BAAC, 1987.

As for mango, the recommended application rate of 15-15-15 was 1 kg./tree or 25 kgs./rai and 125 kgs. for five rai. In practice the average used by farmers growing five rai of sweet tamarind in year three was about the same as for mango at .38 kgs./tree. None of the farmers interviewed in year three used organic fertiliser for sweet tamarind. In total average costs incurred for the main budgeted items, chemical fertiliser and pesticide were considerably lower than the farm budget estimates, at 295 baht for fertiliser compared to 750 baht, and 315 baht for pesticide/insecticide compared to 500 baht for a five rai plot. No rock phosphate was used by this group in year three and none of the farmers hired labour for investment-related activities. All of the sampled farmers grew an inter-crop during the year under study, in this case soybean. As for mango, income from inter-crops was excluded from the project document version of the models for years one, two and three, but is included in

the incremental whole-farm comparison.

Table 11.7 shows the results of a re-interpretation of the project document model based on a "with" and "without" project comparison. As for mango, all data relating to the "without project" situation were obtained from field surveys. Income from non-farm sources "with" the project has also been included from survey data. Estimated cost outlays in years one, two and three have been replaced by actual survey data from the field of 7,316 baht, 870 baht and 610 baht respectively. Unlike in the project document version of the model, income and costs for inter-crop production have been included for years one, two and three. Income from the soybean inter-crop in year three averaged 3,900 baht for the sample as a whole, with total expenditure of 1,845 baht. The loan ceilings available for years one, two and three of the project have been adjusted to the levels of investment and operating costs actually incurred by the farmers. The schedule of debt service has been modified accordingly. The results from this analysis representing the financial status of the investment at the end of year three is shown below. The whole model is given in Table 11.8.

Table 11.7: Financial Indicators for the "With and Without" Project Analysis for a Five Rai Plot of Sweet Tamarind

Project life	20 years
Discount rate (%)	12.5
Net present value (bt.)	20,095
Financial IRR (%)	23.68
Net benefit increase (%)	7.90

This version of the model results in an NPV and FIRR considerably lower than in the project document. The NBI is also lower than expected at 7.90 per cent.

11.6 Conclusions

Although the project in Loei is progressing relatively well in terms of farmer recruitment and area expansion and is reaching farmers of average income status for the Northeastern region, the above analysis suggests that the developmental effects of the project in increasing the income-generating capacity of small-scale farmers may be much less than expected. Consideration of the investment within the "whole farm" setting, allowing for

TABLE 11.8: FARM BUDGET FOR FIVE RAI OF SWEET TAMARIND, FRUIT TREES AND BAMBOO PROJECT, LOEI

PROJECT YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
INFLOWS																				
Gross value of production																				
Tree crop				8000	12000	14000	16000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
Inter-crop	2484	1242	3900																	
Other farm income	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649	24649
Off-farm income	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542	9542
Total inflow	36675	35433	38091	42191	46191	48191	50191	54191	54191	54191	54191	54191	54191	54191	54191	54191	54191	54191	54191	54191
OUTFLOWS																				
Investment	7316	870	610																	
Incremental working capital	870	1072	1845	3150	3650	4050	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250	5250
Operating expenditures	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029	11029
Total outflow	19215	12971	13484	14179	14679	15079	16279	16279	16279	16279	16279	16279	16279	16279	16279	16279	16279	16279	16279	16279
NET BENEFIT BEFORE FINANCING																				
Total	17460	22462	24607	28012	31512	33112	33912	37912	37912	37912	37912	37912	37912	37912	37912	37912	37912	37912	37912	37912
Without project	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737
Incremental (negative)	-10277	-5275	-3130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Incremental (positive)	0	0	0	275	3775	5375	6175	10175	10175	10175	10175	10175	10175	10175	10175	10175	10175	10175	10175	10175
Incremental	-10277	-5275	-3130	275	3775	5375	6175	10175	10175	10175	10175	10175	10175	10175	10175	10175	10175	10175	10175	10175
FINANCING																				
Loan receipts: LT	7316	870	610																	
Loan receipts: ST	870	1072	1845	3950	4750	5400	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900
Debt service: LT				1583	3395	2272	3299	3299	2969											
Debt service: ST	979	1206	2076	4444	5344	6075	7763	7763	7763	7763	7763	7763	7763	7763	7763	7763	7763	7763	7763	7763
Net financing	7207	736	379	-2077	-3989	-2947	-4161	-4161	-3831	-863	-863	-863	-863	-863	-863	-863	-863	-863	-863	-863
NET BENEFIT AFTER FINANCING																				
Total	24667	23198	24986	25935	27523	30165	29751	33751	34081	37050	37050	37050	37050	37050	37050	37050	37050	37050	37050	37050
Without project	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737	27737
Incremental	-3070	-4539	-2751	-1802	-214	2428	2014	6014	6344	9313	9313	9313	9313	9313	9313	9313	9313	9313	9313	9313
CASH POSITION																				
Net benefit after financing	24667	23198	24986	25935	27523	30165	29751	33751	34081	37050	37050	37050	37050	37050	37050	37050	37050	37050	37050	37050
Home-consumed production																				
Cash surplus (deficit)	24667	23198	24986	25935	27523	30165	29751	33751	34081	37050	37050	37050	37050	37050	37050	37050	37050	37050	37050	37050

DURATION	20
Discount rate (%):	12.5
Net present value:	20095.67
Financial rate of return:	23.68
Net benefit increase:	7.90

Source: Updated from table in Fox (1989)

the cost of capital to the farmer, the opportunity costs of taking land out of maize to plant tree crops and including income received from inter-crops, other farming activities and non-farm sources, makes a notable difference to the financial indicators for the project. For mango and sweet tamarind, the adjustments result in financial internal rates of return, which although still acceptable, are considerably below those predicted in the project document. While the analysis has substituted actual for expected income during the first three years of the investment only, before the start of the main income stream from fruit production, the low level of net benefit predicted to accrue to project farmers over the life of the project after repayment obligations have been met remains an outstanding concern warranting close attention from the Bank.

If present trends continue, and yields and incomes are as expected, the panel farmers who elected to grow five rai of mango and sweet tamarind in place of maize will increase their income by only 12 per cent and 8 per cent respectively compared to what they would have earned "without" the investment. The question arises as to whether local farmers would still have joined the project, had they known the net return on the investment, after repayment, was likely to be this limited.

This chapter has demonstrated that the method of project appraisal employed by the BAAC, while considered adequate from a commercial point of view, is inadequate to assess the extent to which the project is likely to assist farmers in increasing income generating capacity. While the project document is only a guide to the investment and many uncontrollable factors can interfere with the assumed relationships both technical and financial, by opting to test financial viability in such a narrow sense, the Bank is omitting to consider the actual returns to the investment from the farmers' point of view, one of the main measures of success from a developmental perspective. This is again illustrative of the conflict between the Bank's expressed development goals and the need to maintain financial viability as lending institution. The challenge to the Bank as a development agency should be to implement carefully designed and financially viable projects that meet the developmental needs of the target group and yield a good financial return **after** repayment obligations have

been met.

The overall quality of project analysis within the Bank could be much improved by paying greater attention to the "without project" situation of the intended beneficiary farmers to enable calculation of incremental returns to the project at the farm-level as well as in aggregate terms. Neglect of this in the past has been due to inadequate time and manpower to collect the necessary data and pressure from donors to prepare a large number of projects within a short period of time. This situation could be remedied by bringing the MOE Unit into the project planning process right from the point of identification[1]. It is within the Unit's terms of reference to carry out contained baseline surveys to generate the necessary data which could also be used in establishing benchmarks against which future monitoring and evaluation activities could be carried out. Active assessment and utilisation of such information would increase the chances that projects remain on course towards their original developmental as well as financial objectives.

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1. At present the PDD and the MOE Unit are in separate departments within BAAC Head Office.

CHAPTER XII

SUMMARY AND CONCLUSIONS

The overall aim of this study has been to shed light on a number of outstanding issues with regard to the developmental effects of institutional credit programmes. The research results supplement the body of literature on rural credit programmes in a number of ways: Firstly, acknowledging the conceptual and methodological problems involved in measuring the farm-level impact of loans, the study adopts an approach which recognises the heterogeneity of farm-households and the complexity of finance-related decision-making. This has allowed for an investigation into the effects of loans within the farm-household economy as a whole, in conjunction with other sources of liquidity including working capital reserves and non-farm income, two variables frequently omitted in traditional econometric models. Secondly, the study looks into the differential effects of rural credit programmes not only among farmers at different levels of resource endowment and land quality but also by access to irrigation facilities. The policy implications of the various analyses for the small farm sector are elaborated below.

Thirdly, while it is broadly acknowledged that credit is only one of several services necessary to support development of the small farm sector, few studies have investigated the extent to which the operation of rural credit programmes may be affected by the provision of support services such as extension. Thus a further aim of the study has been to increase understanding and provide insights into a) the impact of loans disbursed with dedicated extension advice among borrowers who would not normally be considered eligible for formal loans; and b) the institutional problems associated with this type of undertaking. Fourthly, on the assumption that short-term production loans are unlikely to promote the type of farm-level change that will facilitate long-term increases in income-generating capacity among small farmers, the study has examined the effectiveness of long-term development loans

within the project framework. Research studies on this topic are also few in number. The results highlight limitations in the identification, preparation, and appraisal methodology employed in the design of long term credit projects for the small farm sector which may serve to undermine their effectiveness as catalysts for increasing agricultural productivity and incomes, and proposes an alternative methodology. Conclusions drawn from the various questions investigated in relation to the developmental role of BAAC in rural Thailand and related recommendations for future policy orientation are elaborated in detail below.

Since its foundation in 1966, BAAC has progressed rapidly in terms of the scale and scope of its operations. It survived the financial crisis of the mid-1970s to become one of the most important government agencies servicing the agricultural sector. The Bank has a national network of branches and a competent staff who, on the whole, have administered increasingly large sums efficiently. While the scale of the operation has extended into more marginal areas, BAAC has managed to maintain rates of loan repayment which is one of the most important criteria of its success as a financial institution. Given that BAAC has become a well-established organisation with a government-appointed role in rural development, this study presents an analysis of its role as a development agency. The analysis has focussed on two areas central to the Bank's effectiveness in this respect:

a) The equity of credit provision spatially, and by the economic level of borrowers; and

b) the farm-level effects of three types of lending instrument namely, short-term production loans by access to irrigation and farm-size category (the "credit-only" case); the effect of loans given in association with technical support among small-scale farmers (the "credit-extension" case); and of long-term investment loans disbursed within the project format (the "project lending" case).

With respect to (a) the study shows that the Central region receives a share of BAAC funds which is disproportionately large in relation to the size of the agricultural population, in spite of recent trends in the registration of clients and in the allocation of loans which have tended to reduce inter-regional inequality. There is also a striking bias with respect to the farm-size characteristics of clients' farms, with medium and larger-scale farmers having greater access to subsidised credit services than small-scale farmers. This pattern continues

in spite of convincing evidence that the small-scale farmers among BAAC's existing clients have a repayment record which is better or certainly no worse than that for larger scale operators. The bias against lending to small-scale farmers is largely explained by branch-level operations being closely tied to the demands of the Branch Evaluation Procedure, which is founded on the application of "sound banking" principles in order to maintain the financial *viability of the organisation. Branch staff,* whose prospects for promotion and other fringe benefits depend on scoring high marks in the evaluation, pursue *targets related to the* maximisation of disbursement and repayment rates while keeping operational costs to a minimum. For most branch managers this results in the employment of strategies which focus on the most credit-worthy farmers, those considered to be "low-risk" in terms of repayment capacity. Without specific targets for small farmer lending being incorporated in the Branch Evaluation Procedure to force action at the branch level, this group of farmers is likely to remain under-represented within the Bank's loan portfolio. Evidence from the study points to the conclusion that BAAC's credit allocation policies have tended to reinforce rather than abate inequalities within the agricultural sector counter to the government's apparent support for a "uni-modal" development strategy.

With regard to the question of effectiveness, formal credit institutions such as BAAC are predicated on the assumption that there is a "causal" linkage between loans, farm-level investment, productivity and incomes. The results of this study with respect to the role of production loans from a case study of farmers in Chainat province, Central Thailand, indicate that this chain of relationships cannot always be demonstrated to exist. Taking the sample as a whole in the irrigated area, the expected statistical relationships between credit and expenditure on production inputs is absent. A plausible explanation, consistent with both field observations and the analysis, is that many farmers, particularly those operating in irrigated areas, have adequate resources of their own to fund farming operations, and loans often have only marginal effects on farming practice and productivity. This is especially the case for larger-scale farmers for whom institutional loans cover a smaller proportion of total production costs and who generally have other sources of liquidity in addition to credit from

which to finance farming activity.

The most important finding from the case study in Chainat is that the role of credit within the farm-household economy varies significantly by scale of farming operation. Generally in the irrigated area the relationship between production loans and expenditure on farm inputs becomes weaker for successive farm-size categories and is completely absent for large-scale farmers in both areas. The relationship is strongest for small-scale farmers in the rainfed area for whom loans appear to be a more crucial determinant of input expenditure in combination with what limited resources they have, than for their medium- and large-scale neighbours. This being the case, the question was raised as to what extent loans, given with the benefit of dedicated extension advice, could be used to increase the farm-level productivity and incomes of farmers currently outside the net of eligible borrowers.

Few credit programmes throughout the world have attempted to link formal credit with extension beyond the location-specific project framework. Having tested the concept within the context of a pilot project in seven provinces within the Northern and Northeastern regions from 1984-86, BAAC and DoAE embarked on the EC-funded Small Farmers' Recruitment and Servicing Project, to provide joint credit-extension packages for a specific target group of small-scale farmers in all Northeastern provinces from 1987 to 1991. Based on data from a survey in Ubon, the study investigated the relationships between credit, technical support, use of fertiliser and production for a small sample of target group farmers during the 1989/90 crop year. The analysis shows that access to loans and technical support both have a positive and direct influence on the use of productivity increasing inputs among small farmers; the relationship however attains statistical significance for loans only. This suggest that within the context of the project in Ubon, the role of technical support in influencing decision-making with regard to input use among BAAC clients is still limited. Further research in this area could incorporate a "control group" consisting of non-clients receiving regular extension support in order to compare their performance with that of the target group and the incorporation of additional components into the project design as discussed below.

The overall success of the Small Farmers' Recruitment and Servicing Project and any future attempts to provide co-ordinated support services for the benefit of the rural sector, depends heavily on the establishment of a sound working relationship between BAAC and DoAE staff, particularly at the provincial and district levels. In the past this relationship has been marred by conflict between their respective development philosophies and working practices and inadequate appreciation of the mutual benefits of cooperation. This project was the first attempt to provide a co-ordinated credit-extension service on a region-wide basis. Although the project had been operating for three years at the time of the survey, the first two years were effectively a period of institutional learning in which various practical problems related to basic weaknesses in the project design and underlying differences between the two agencies came to the fore.

A number of measures put into place for the start of FY1989 resulted in some improvement in cooperation between the two agencies in Ubon and other Northeastern provinces during the third year of operation. At this stage, that such improvements were only partially reflected at the farm-level should not be taken to undermine the concept behind the project as a whole. The concept has been recognised as having considerable potential not only to assist small farmer development but also to forge a closer and mutually beneficial working relationship between the two agencies and act as a springboard for future joint undertakings for the benefit of this group and the sector as a whole, as advocated by the Sixth National Development Plan. Further improvements to the project design including the introduction of a savings component, offering loans for non-farm activities, women's production groups and medium-term investment[1], additional staff training, procedural guidance and building in performance incentives are likely to increase the farm-level impact of the project over time. If the concept of a linked credit-extension service for small-scale farmers can be considered viable and effective using grant aid in the Northeastern region, it is

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1. BAAC Regulation 7 covers both short- and medium-term loans.

likely that potential exists for the project to be implemented in all regions of the country as part of a government-sponsored scheme. Plans for this type of undertaking are already underway.

While short-term loans are an important catalyst to increasing farm-level productivity, they are unlikely to be a sufficient factor to bring about substantial improvements in the productive capacity of the small farm sector. BAAC has recognised that to carry out the types of investment leading to permanent increases farm productivity, such farmers need access to longer-term financing within a supportive technical and financial framework, hence the emergence of the "special project" lending category in the late 1970s. The effectiveness of long-term project loans was investigated through a case study of the Loei Fruit Trees and Bamboo Project, funded under Sub-Project 2 of the EC Northeast Poor Farmers' Scheme. Although the project in Loei is progressing relatively well in terms of farmer recruitment, area expansion and reaching farmers of average income status for the Northeastern region, the benefits of participation from the farmers' point of view appear to be questionable. Re-casting the "partial" financial models included in the project document within a "whole farm" model in order to carry out an incremental-type analysis taking account of the "without project" situation and the cost of capital, shows that the effects of the project in increasing the income-generating capacity may be less than could be reasonably expected given the inputs of land, labour and capital involved. The question arises as to whether local farmers would still have joined the project, had they known the net return on their investments was likely to have been so limited. Comparing the financial returns to project farmers with those accruing the farmers investing in fruit trees without formal credit arrangements and input supply, would be indicative of the extent to which the project format has brought advantages or disadvantages to this group.

The conclusions from the analysis in case study three again illustrate the conflicts which exist between the Bank's expressed developmental goals with regard to small farm development, often made a condition of foreign loans, and its business objectives. The

method of financial appraisal employed is no different for small farm development projects in the Northeastern region than that used for example on a large-scale individual dairy enterprise in Nakorn Ratchisima. The Bank's main concern is to establish the "internal" financial viability of the investment and demonstrate to the satisfaction of the Board of Directors that it will generate enough capital in aggregate terms for repayment with interest to be completed within the specified period. The quality and outcome of implementation is another question which is handed over to a separate non-technical division within the Bank.

Aside from the question of the financial viability of projects, that BAAC has taken only a "partial" view in designing and analysing projects is partly due to the pressure it is under from donors to prepare and appraise projects as quickly as possible[1]. However, the fact remains that in the rush to meet deadlines and begin loan disbursement from overseas sources, inadequately researched projects are often approved by the Board and replicated[2] on the basis of financial indicators which may have little grounding in reality. By opting to measure financial viability in this narrow sense, the Bank is effectively over-looking the actual returns to the investment from the farmers' point of view within projects ostensibly designed to assist them. While there have been some relatively successful projects under Sub-Project 2 of the Northeast Poor Farmers' Scheme[3], the methods employed do not do justice to the task in hand with regard to accelerating development for the small farm sector. In the case of the Loei Fruit Trees Project, every attention should be paid to dealing with outstanding field management issues and seeing that farmers receive adequate extension and marketing support so as to ensure the locational advantages and yield potential of the project are not eroded to the further cost of the farmer-participants. Within BAAC's planning procedure, in

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1. This was particularly the case for Sub-Project 2 of the Northeast Poor Farmers' Scheme when 21 separate projects were designed between FYs 1987 and 1988 (BAAC, 1989).

2. The design for the Loei Fruit Trees Project was replicated in Korat, Buriram and Chaiyaphum with very poor results.

3. For example the dairy project in Nakon Ratchisima and the sericulture project in Chaiyaphum (BAAC, 1990).

addition to the question of financial viability, there is a need to revise project design and appraisal procedures to pay much closer attention to maximising the farm-level returns of a particular project intervention. In the case of development projects for small-scale farmers, the challenge is to design and implement projects in conjunction with other government support agencies and the targeted beneficiaries, which simultaneously fulfil both objectives.

There is also a definite need within the Bank's planning procedure for cost effective baseline studies to be carried out prior to preparation, to enable project officers to gain a greater understanding of the agro-economic characteristics of farmers within the area, the capacity for and quality of service provision locally to gauge the likely impact of the project and to quantify the "without project" situation of the intended beneficiary farmers. Neglect of these aspects has, in the past, been due to work pressure and inadequate manpower within the PDD to collect and analyse the necessary data. This situation could be remedied by bringing the MOE Unit into the project planning process from the point of identification. It is within the Unit's responsibility to carry out baseline surveys using rapid appraisal techniques, which would not only provide information to assist with project design but would also help establish benchmarks and critical indicators against which future monitoring and evaluation activities could be carried out. As far as development of the vulnerable small-farm sector is concerned more time and consideration given to project design and analysis may result in fewer projects being undertaken within any one year, but would increase the chances of effective developmental change among farmers who have few other productive resources of fall back on apart from their land and labour.

While there is a strong case for increasing the developmental role of the Bank through innovative methods and approaches, it should be remembered as a state enterprise Bank, BAAC cannot concern itself exclusively with the small farm sector. It is also responsible for supporting the growth and development of the agricultural sector in general and the farmer institutions. The Bank is required to follow government policies for promoting intensification throughout the country, assist with marketing problems for all farmers and facilitate increases in aggregate production of export crops, particularly in the

progressive farming areas. The demand for credit to finance intensification for example is expected to increase as the process gathers momentum[1].

In the attempt to meet the demands placed upon it from various quarters, BAAC is faced with the difficult task of steering a middle course between its primary role as a Bank which has to safeguard financial viability in order to provide an on-going service, and its role as a development agency, a conflictual situation which is not unusual for a bank of this type. BAAC's functions already extend well beyond those of a passive supplier of funds and its efforts have been commended and supported by outside agencies including the World Bank. However, the question arises as to what extent the Bank can genuinely contribute to a uni-modal development strategy in Thailand, when the narrow financial margins within which it has to operate result in the application of rationing and other "sound banking" criteria which serve to exacerbate rather than reduce inequalities spatially and by economic group. If the RTG is committed to the ideal of BAAC providing equitable access to subsidised credit for small-scale farmers across the country, the Bank will require supplementary capital to meet the additional funding and operating costs of such an endeavour and safeguard it against any additional risk it may pose to the viability of the lending operation. This could be achieved either through a large infusion of low-cost funds from the Bank of Thailand or through a small increase in the interest rate which would constitute a fractional increase in borrowing costs among smaller borrowers. In the interests of its own independence, BAAC's preference would be for the second option, however, mainly for political reasons, the RTG has historically opted for the first on the understanding that the capital may have to be repaid at any time.

In addition to extra funding, there is also a need for more flexible lending policies that take into account farmers' total liquidity requirements including those for non-farm or

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1. The credit in kind and marketing assistance programmes are intended to provide a "complete cycle" of services to farmers from credit and input supply through to marketing and repayment to assist with this process.

small-scale agro-processing activities[1] and savings mobilisation. Moreover, there is still room for the Bank to expand operations in the predominantly rainfed areas of the country, where farmers have a greater propensity to use credit productively than previously assumed. Grant funds from agencies such as the EC should be used to encourage further research and experimentation to develop more innovative approaches to small farmer lending and increased understanding of the sources and uses of liquidity among existing farmer-clients and the economic structure of farm-households currently judged ineligible for loans. The Bank's experience gained in implementing the IFAD Pilot Project in Smallholder Lending from 1984-86, which formed the prototype for the EC sponsored Small Farmer Recruitment and Servicing Project, is a good example of the way in which institutional learning can result in access being extended to larger numbers of poor farmers within a supportive institutional environment. As in the sphere of project lending, this will necessitate forging closer links and feedback channels between the Bank's on-going research, monitoring and evaluation activities, project planning and concerned government departments.

To its credit, BAAC has in recent years actively encouraged research into the developmental implications of the lending programme and recognised the importance of monitoring and evaluation as a means to assess the farm-level effects of particular programmes and projects. While remarkable progress has been made in increasing the flow of funds to the agricultural sector, the extent to which the Bank has taken steps to adjust lending policies in response to such findings and thereby begin a process to counter-balance the disequalising effects of the programme, has been limited so far. Given the scale and scope of BAAC's operation, even a contained re-orientation of the lending policy in conjunction with those of other support agencies under the umbrella of a uni-modal strategy for rural development, could have a potentially dramatic effect on aggregate measures of inequality

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1. Historically the bank has been prevented from lending for non-farm activities due to the provisions of the BAAC Act which restricts lending to agricultural activities only. In recognition of the increasing proportion of total household income supplied from non- and off-farm sources, the bank is investigating ways to have the Act modified to allow it to venture into more broadly-based "rural" lending.

within the lending programme itself and possibly on poverty and inequality indicators for the country as a whole. If it is accepted that market forces cannot be relied upon to bring about equitable developmental change for the poorest income groups, then an active government commitment to such an approach may result in benefits worth any sacrifices in efficiency and aggregate growth which may or may not occur.

ANNEX 1

Table A1.1: Path Analysis Results: Nang Lue

			EFFECTS				
Figure	Path	Orignal r	Direct	Indirect	Joint	Reconstructed r	Co-ordinated error
7.4	P_{21}	.175					-
	P_{32}	.034					-
	P_{43}	-.109	-.122	-	.013	-.109	
	P_{42}	.375	.379	-.004	-	.375	
	P_{52}	-.198	-.234	.019	.017	-.198	
	P_{51}	.058	.099	-.041} -.0002}	-	.058	
	P_{61}	.714	.721	-.0003} -.0013} -.0045}	-	.714	
	P_{76}	.615	.168	-	.451 } -.0043}	.615	
	P_{71}	.756	.632	.120} .0036}		.756	
	P_{65}	.021	-.023	.0028	.0418	.021	
	P_{63}	-.061	-.090	-.0089	.036} -.0016}	-.064	.003
	P_{64}	.089	.082	-.0010} -.0100}	-.003	.068	.021
	P_{54}	-.035	.053	-	-.088} -.0003}	-.035	
	P_{73}	.093	.072	-.0102	.0316	.093	
7.5	P_{21}	.016				-	
	P_{32}	.105				-	
	P_{43}	-.341	-.376	-	.030	-.346	.005
	P_{42}	.293	.333	-.039	-	.293	
	P_{52}	-.135	-.143	.006	-	-.137	-.002
	P_{51}	.379	.381	-.022	-	.359	.02
	P_{61}	.571	.516	.062	-	.578	.007
	P_{76}	.424	.392	-	.028	.420	.004
	P_{71}	.313	.054	.034} .224}	-	.312	.001
	P_{65}	.362	.163	-	.217	.380	.018
	P_{73}	.316	.310	-	-	.310	.006

			EFFECTS				
Figure	Path	Orignal r	Direct	Indirect	Joint	Reconstructed r	Co-ordinated error
7.6	P_{21}	.099				-	
	P_{32}	.058				-	
	P_{43}	-.061	-.062	-	.001	-.061	
	P_{42}	.081	.018	.021	-.003	.018	
	P_{52}	-.345	-.368	.023	-	-.345	
	P_{51}	.193	.231	-.036	-	.195	.002
	P_{61}	.104	.124	.033} -.050}	-	.107	.003
	P_{76}	.165	.121	-	.004	.165	
	P_{71}	.367	.355	.021	-	.367	
	P_{65}	.202	.170	-	.024	.194	.008
	P_{63}	-.257	-.228	-.017	-	-.245	.012
	P_{64}	.267	.281	-.006	-.014	.261	.006
7.7	P_{21}	-.090				-	
	P_{32}	-.021				-	
	P_{43}	.009	.009	-	-.017	.008	.001
	P_{42}	.835	.835	-.0005	-	.835	
	P_{52}	-.261	-.645	.359} -.004}	-.024	-.314	.087
	P_{51}	.182	.300	-.061} -.024} -.032}	-	.183	.001
	P_{61}	.803	.793	.007	-	.800	.003
	P_{76}	.614	.516	-	.098	.614	
	P_{71}	.536	.123	.416	-	.539	.003
	P_{64}	.128	.072	-	.055	.128	
	P_{54}	-.128	.462	-	-.566	-.104	.024

Table A1.2: Path Analysis Results: Nong Noi

			EFFECTS				
Figure	Path	Orignal r	Direct	Indirect	Joint	Reconstructed r	Co-ordinated error
7.8	p_{21}	-.037				-	
	p_{32}	-.090				-	
	p_{43}	-.091	-.093				
	p_{42}	-.017	-.025				
	p_{52}	.144	.150	-	-.007	.143	.001
	p_{51}	.174	.178	-.0055		.173	.001
	p_{61}	.422	.402	-.009} .032}		.425	.003
	p_{76}	.209	.024	.185	-.0003	.209	
	p_{71}	.452	.440	.010} .0026}	-	.452	
	p_{65}	.253	.183	-	.070	.253	
	p_{64}	.040	.084	-.0056} -.0025}	-.0414	.035	.005
	p_{73}	.069	.027	-.0003	.043	.069	
7.9	p_{21}	-.195				-	
	p_{32}	-.010				-	
	p_{43}	-.061	-.050	-	-.0005	-.050	.010
	p_{42}	-.052	-.058	-.0005	-	-.058	.006
	p_{52}	.295	.298	-.005	-.0087	.284	.011
	p_{51}	-.034	.045	-.058} -.021}	-	-.034	
	p_{61}	.151	.105	-.019} .018}	-	.104	.047
	p_{76}	.394	.340	-	.054	.394	
	p_{71}	.409	.358	.051	-	.409	
	p_{65}	.556	.571	-	.004	.575	.019
	p_{64}	.057	.091	-.064	.030	.057	
	p_{54}	-.113	-.106	-	-.015	-.121	.008

Table A1.2: Path Analysis Results: Nong Noi

		EFFECTS					
Figure	Path	Orignal r	Direct	Indirect	Joint	Reconstructed r	Co-ordinated error
7.10	P_{21}	.072				-	
	P_{32}	-.104				-	
	P_{43}	-.222	-.219	-	-.011	-.230	.008
	P_{42}	.115	.093	.022	-	.115	
	P_{52}	.080	.068	-.007	-.019	.042	.038
	P_{51}	-.111	-.101	.0048} -.015}	-	-.111	
	P_{61}	.249	.280	-.018} -.037} .024}		.249	
	P_{76}	.165	.099	.025} .029}	-	.153	.012
	P_{65}	.350	.340	-	-.031}	.350	
	P_{65}				.0375} .003}		
	P_{63}	.141	.120	-.045} .0085}	.057	.141	
	P_{64}	.214	.203	-.025} .063} -.027}	-	.214	
	P_{54}	.185	.168	-	.008	.185	
	P_{73}	.182	.145	-	.023} .014}	.182	
	P_{71}	.165	.111	.025	.029	.165	
7.11	P_{21}	.045				-	
	P_{32}	-.348				-	
	P_{43}	-.450	-.618	-	.168	-.450	
	P_{42}	-.265	-.481	.215	-	-.266	.001
	P_{52}	.480	.495	-.012	-.002	.481	.001
	P_{51}	-.042	-.049	.022} -.015}	-	-.042	
	P_{61}	.324	.536	-.200	-	.336	.012
	P_{76}	-.163	-.260	-	.085	-.175	.012
	P_{71}	.159	.263	-.084} -.019}	-	.160	
	P_{63}	-.175	-.129	-.226	.170	-.185	.010
	P_{64}	.379	.502	-.0024	.064} -.184}	.379	

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