

**Institutional Credit Supply and Repayment  
Behaviour of Farmers in Kerala :  
A Policy Perspective**

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**DIVISION OF AGRICULTURAL ECONOMICS  
INDIAN AGRICULTURAL RESEARCH INSTITUTE  
NEW DELHI-110 012**

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*Dedicated to the Lotus Feet  
of  
Lord Venugopala Krishna  
Alakananda*

**INSTITUTIONAL CREDIT SUPPLY AND  
REPAYMENT BEHAVIOUR OF FARMERS IN  
KERALA : A POLICY PERSPECTIVE**

By

**SATHEES BABU K.**

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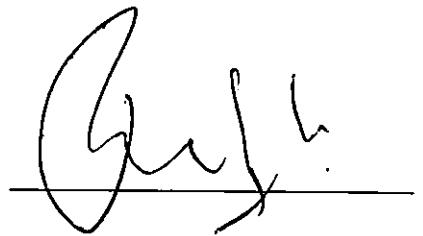
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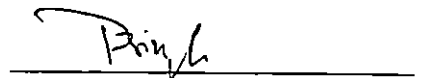
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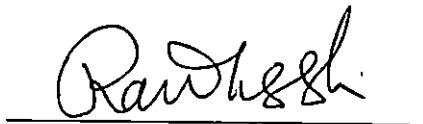
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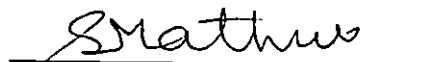
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## CERTIFICATE

This is to certify that the thesis entitled, "Institutional Credit Supply and Repayment Behaviour of Farmers in Kerala : A Policy Perspective", submitted to the Faculty of Post Graduate School, Indian Agricultural Research Institute, New Delhi, in partial fulfilment of the requirement for the award of the degree of Doctor of Philosophy in Agricultural Economics by Shri Sathees Babu K. embodies the results of the *bona fide* research work carried out by him, under my guidance and supervision. No part of the study reported here has so far been submitted anywhere for publication or for any other degree or diploma.

It is further certified that such help or source of information as have been availed during the course of investigation, has been duly acknowledged by him.

Place : New Delhi  
Date : 8th December, 1998

  
(R.P. Singh)  
Chairman  
Advisory committee

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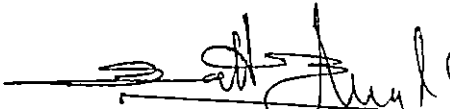
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## Chapter I

# INTRODUCTION

Agricultural credit has been a cornerstone of agricultural development programmes in most developing countries (Ladman and Tinnermeier, 1981). Traditionally, credit plays a crucial role in oiling the wheels of agricultural production by allowing producers to satisfy the cash needs induced by the production cycle during which time very little cash revenue is generated. The supply of credit facilitates not only the consumption at normal levels but also the optimal use of purchased inputs till cash income is generated by the sale of the harvest (Baker, 1968; Penny, 1968; Barry *et al.*, 1981; Feder *et al.*, 1990).

The form and functions of credit change all along the locus of agricultural development with cumulative expansion (Rajagopalan, 1968). Hence, a number of developing countries have evolved various credit policies to achieve the desired goal of agricultural development, and India is no exception. When the new seed-fertilizer-irrigation farm technology was launched in the country during *Kharif* 1965, the capital-intensive nature of the new technology was in contrast to the farms in general which were capital-starved. This called for the provision of right amount of credit in the right time and at reasonable cost to the needy farmers for the successful adoption of the new agricultural technology, increased production and productivity. The provision for such support was considered essential as it was felt that a sizeable section of farmers who would desire to participate in the programme could not be able to do so if they were left to themselves to search for the extra cash needed to purchase the

vital inputs (Desai and Naik, 1971). Thus, the role of credit at this stage was to enable farmers to switch over to a superior production function and provide support particularly to those whose low income-saving base precluded their undertaking investment with credit (Barry and Boehlje, 1986; Gadgil, 1986). In other words, farm technology without adequate capital to facilitate its use was a high cost dam without field channels for irrigation (Rajagopalan, 1968).

There were government interventions in the credit market to meet the national priorities through appropriate policy changes as the existing rural credit market was not a perfectly competitive one (Bhatt and Roe, 1979; Hoff and Stiglitz, 1990). Market failures in terms of coverage to small and marginal farmers and less endowed regions justified such market interventions (Besley, 1994). Initially, the Government of India (1976) nurtured the cooperative movement deliberately to institutionalise efforts to wean away farmers from the clutches of the private money lenders in the village. The crop loan system was introduced and an "Action Programme for Cooperative Credit" was drawn in 1963 for ensuring cooperative credit to the intensive agricultural area programmes. However, the bulk of the farming population could not secure adequate credit from cooperatives due to operational defects and financial deficiencies of the cooperatives. The increasing demand for capital in agriculture was so vast that the cooperatives were not able to match the supply. This resulted in 'credit gaps', and it became increasingly clear that the progress of agriculture could not be tied to the progress of cooperative credit. The Government of India was compelled to adopt a multi-agency approach to rural financing by inducting the commercial banks into the picture



through the social control in 1968, and social ownership in 1969. This gave way to an era of 'social banking' (Government of India, 1972; Government of India, 1976; Reserve Bank of India, 1981; Reserve Bank of India, 1989).

There is unanimity in literature on the fact that the credit policies initiated during the sixties was instrumental in the widespread adoption of the 'green revolution technology' in India (Baker and Bhargava, 1974; Government of India, 1976; Chadha, 1978; Dhawan and Kahlon, 1978; Singh and Ramanna, 1981; Tyagi and Pandey, 1982; Desai *et al.*, 1988; Reserve Bank of India, 1989; Krause *et al.*, 1990; Dandekar, 1993; Desai 1994a, and Gadgil, 1994). The farm credit policy was reoriented from 'class banking' to 'mass banking', and the thrust was shifted from "credit worthiness of person" to "credit worthiness of purpose" (Dandekar, 1993). The post-green revolution phase witnessed not only higher total factor productivity, but also higher contributions of institutional credit as sources of growth (Desai 1994).

However, these achievements were fraught with a high cost. Unfortunately, the higher credit disbursal in the primary sector was accompanied by a high delinquency rate as well. There were growing concerns on the mounting overdues that severely crippled the financial institutions ability to recycle the funds (Government of India, 1972; Baker and Bhargava, 1974; Reserve Bank of India, 1974; World Bank, 1975; Government of India, 1976; Reserve Bank of India 1977; Reserve Bank of India, 1980; Planning Commission, 1985; Reserve Bank of India, 1989; Desai and Namboodiri, 1991; Shivmaggi and Shukla, 1991; Dandekar, 1993; Desai, 1994b; Kurup, 1996 and Talwar, 1996). The Khusro

Committee (1989) appointed by the Reserve Bank of India (RBI) to review the agricultural credit system in India concluded that overdues were an all pervasive malady, and was neutral to the type of lending institutions. The Committee reiterated that the high incidence of overdues in the system has become a major constraint in the expansion of credit and development of agriculture (Reserve Bank of India, 1989).

Although the growth in the flow of production credit was highest in Kerala (Gadgil, 1986; Chand, 1992; Gangadharan, 1994), the state is also not free from the maladies that have afflicted the institutional credit agencies in India as a whole. Agricultural credit is not only an issue of quantity, but of quality also. The increased availability of institutional credit has given rise to many related problems such as inadequacy, misutilization, lack of timeliness in credit delivery, which directly or indirectly have a bearing on the repayment of the loan, and therefore the overdues level. The overdues of agricultural sector advances of institutional credit agencies have been mounting in Kerala from the late eighties. Since the efficiency and effectiveness of the flow of credit depends on the delivery mechanism at the beneficiary level, a sound rural credit system shall advance the right quantum of credit to meet the working capital requirements of the borrowers at the right time, so that it is utilized properly in the production process so as to generate a surplus, which will be utilized to repay the principal plus interest amount. Knowledge of institutional credit environment prevailing, socio-economic characteristics of the borrowers, issues like adequacy, timeliness and utilization of loan that have a bearing on the repayment behaviour, and therefore, on the overdues level would be playing a significant role in formulating a healthy policy perspective.

Very few studies have addressed these issues in the past with respect to Kerala.

Further more, the overdues has been a dead weight on the edifice of the agricultural credit system in India, very little efforts have been made in predicting the repayment behaviour of the borrowers in India in general and in Kerala in particular. Such an approach will go a long way to identify the potential defaulters and thereby better credit recycling through reduced delinquency rate. The prediction of repayment behaviour of the borrowers may also improve the economic viability of the financial institutions in the long run. The present study is an attempt to analyse and address these issues with the following specific objectives :

1. to examine the growth in credit institutions, their disbursement and recovery performance in Kerala
2. to study the economic characteristics of the borrowers and the extent of their credit need in crop production
3. to examine the pattern of credit supply, timeliness, repayment behaviour and overdues of the borrowers, and
4. to identify the factors influencing the overdues in order to screen the potential defaulters and suggest suitable policy prescription.

### Organization of the Thesis

Besides the introductory chapter, the study is organised into six chapters. Chapter two is a comprehensive review of literature of the study. Chapter three describes the socio-economic characteristics of the study area. The analytical tools and methodological framework employed in the study are presented in the chapter four. The results of the study are enumerated and discussed in chapter five. The sixth chapter summarises the main findings and provides conclusions drawn from the analysis along with the policy implications thereof.

## Chapter II

# REVIEW OF LITERATURE

Lack of adequate capital has been acknowledged as one of the most serious inhibiting factors in modernization of traditional agriculture and as the key element behind the vicious circle of poverty (Adams, 1971; Singh and Jha, 1971). Recent farm economic studies in India have further made abundantly clear that institutional credit played a crucial role in increasing productivity (Singh and George, 1968; Mehta and Sidhu, 1971; Singh *et al.*, 1971; Subrahmanyam, 1975; Dhawan and Kahlon, 1978; Singh and Ramanna, 1981; Gadgil, 1986; and Desai, 1994a). Thus, the development role of credit institutions in the Indian rural context is a *fait accompli* (Reserve Bank of India, 1981). The basic concept of development banking is that credit is consciously used as a lever of development.

With the multiple agencies operating in the field of rural credit, a number of problems arose such as un-coordinated purposes, overlapping and duplication of banking facilities and lagging recoveries (Dandekar, 1993). It is no secret that our agricultural credit system has been seriously weakened by the burden of excessively subsidised interest rates, low recovery of loans, high intermediation costs and debt write-offs. This is also the experience of many other countries which have placed greater emphasis on subsidising credit and paying less attention to expanding a financially viable credit structure (Singh, 1995).

It is against this backdrop that a systematic review of literature relevant to the objectives of the study are attempted in this chapter. It will provide the background information in the formulation of the objectives and the analytical framework used therein. The review is being carried out under the following sub-heads :

- 2.1 Pattern of credit supply
- 2.2 Credit need and adequacy of credit
- 2.3 Timeliness of credit
- 2.4 Overdues and repayment behaviour

### 2.1 Pattern of Credit Supply

The All India Rural Credit Survey Committee (1954) noted that in spite of various procedural and administrative reforms, the cooperatives who were the sole institutional agency of credit dispensation to the farmers accounted for only 3.1 per cent of the total borrowings of cultivators. More than 93 per cent of the estimated credit requirements were met by the cultivators from the village moneylenders and the traders (Reserve Bank of India, 1954).

The All India Rural Credit Review Committee (1969) that made a comprehensive review of the total credit system for agriculture, estimated that the non-institutional sources still accounted for 81 per cent in total agricultural credit. The Committee observed that cooperative credit was not oriented adequately to production credit needs. It fell short of timeliness, adequacy and dependability (Reserve Bank of India, 1969a).

The compound growth rate in the flow of production credit in India during the seventies was 14.52 per cent per annum in nominal terms

but it was just 3.72 per cent per annum in real terms. Among the states, it was very high for Kerala in nominal (24.32) as well as real (12.61) terms. For Punjab and Haryana, the corresponding figures were 16.64 (5.63) and 22 (10.50) percentages respectively (Gadgil, 1986).

The study by Desai *et al.* (1988) in the semi-arid tropical areas of Andhra Pradesh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh revealed that the degree of agricultural progress was associated positively with three types of factors related to institutional credit. They were (a) density of Rural Financial Institutions (RFIs), (b) overall amount of credit per hectare, and (c) shares of various types of agricultural credit. While the first two were invariably highly positively associated, not all types of agricultural credit had such association.

According to Pandey and Kumar (1988), fertiliser consumption, irrigated area, application of high-yielding varieties, and area under cash crops were the factors that affected the flow of credit in the different states in India.

Over the years, the commercial bank's advances to agriculture is assuming greater importance over the cooperative credit. Andhra Pradesh, Tamil Nadu, Gujarat, Kerala, Madhya Pradesh, and Karnataka were the eight states that received the largest amount of commercial bank credit. Between 1972 and 1985, there was increasing concentration of institutional credit to agriculture in few regions and states indicating regional disparity in the credit dispensation (Dadibhavi, 1988).

Another study by Haque and Verma (1988) indicated that commercial bank credit to agriculture accounted for 46.6 per cent of total



institutional credit to agriculture in Haryana. Similarly, it accounted for 43.8 per cent in Punjab, 37.1 per cent in Kerala, 32.4 per cent in West Bengal, and 31.1 per cent in Jammu and Kashmir. There was wide variation in the per hectare availability of cooperative credit also. It ranged from a low Rs. 24 per hectare in Bihar to Rs. 1490 per hectare in Kerala, which topped all the states in India.

The direct credit to agriculture by the commercial banks in India which stood at Rs. 54 crores in June 1969 in 256 thousand accounts increased to Rs. 8117 crores in June 1986 in 15,988 thousand accounts. The categorywise share in credit was 33, 29.1 and 37.9 percentages by the marginal, small and medium/large farmers respectively (Reserve Bank of India, 1989).

A study on the inter-regional and inter-temporal flow of short-term and term loans in India during 1979-80 to 1985-86 was conducted by Chand (1992). The study concluded that Kerala topped in receiving both types of credit in most of the years. Against the national average of Rs. 116 and Rs. 147 supplied per hectare of cropped area by the primary agricultural credit societies (PACS) and commercial banks respectively during 1985-86, it was as high as Rs. 526 and Rs. 425 for Kerala.

Gangadharan (1994) after analysing the institutional credit supply pattern in India observed that five states, viz., Andhra Pradesh, Maharashtra, Uttar Pradesh, Tamil Nadu and Kerala accounted for 60 per cent of the institutional credit to agriculture as against a 39 per cent share in the net sown area. The low credit absorption per hectare in States like Orissa (Rs. 197), Bihar (Rs. 194) and West Bengal (Rs. 443) having rich natural resources underlined the wide disparity in credit absorption

across the States. Generally, the areas with poor credit absorption capacity were those where infrastructural facilities were not well developed.

Most studies cited above focussed solely on the dimensions of inter-state disparities in institutional credit supply in India. Issues such as inter-regional disparity in credit flow within a state were largely not attempted.

### 2.2a Credit Need

The demand for agricultural credit varies by farm, by region and over time. The determinants of demand for credit are liquidity, crop pattern and cropping intensities, size of family and farm labour, cost of credit and mode of transactions, degree of risks and uncertainties involved in production and marketing inclusive of inventory control and managerial skills (Rajagopalan, 1968).

Since credit is only one amongst the several factors involved in successful farming, a proper appraisal of the credit requirements of the agriculturist is of crucial importance from the point of view of the lending banker (Reserve Bank of India, 1969b). While a judicious use of credit helps to increase production, both over or under-financing are detrimental to the interest of the borrowers as well as the lenders (Reserve Bank of India, 1972).

Farmers need cash for buying annual inputs and carrying out operations on their farms. A portion of the total cash needs is met with their own funds and the remaining portion is borrowed from outside (Sharma and Prasad, 1971).



Singh and Jha (1971) found that credit needs varied substantially between farms and hence the production (income) potential rather than any other criterion would serve as an appropriate basis for this assessment.

Dhawan and Kahlon (1978) estimated the availability of working capital as the sale of previous crops produced plus amount borrowed and other funds available in that season minus expenses on fixed activities and family needs.

The paid out costs per hectare of cropped area was taken as the basis to work out the credit requirement by Subbarao (1980). The study indicated that the demand for short-term production credit for both small and large categories of farmers were directly related to the current level of input requirements and inversely related to the self-financing ability of the farmers, given the risk and uncertainty in Eastern and Western Uttar Pradesh.

Short-term credit requirement was measured as the difference between the total paid-out costs in a crop year and the preceeding year's surplus farm income. In the absence of data on preceeding year's surplus farm income, it was substituted with the surplus income in the reference year (Sai, 1988). The study revealed an inverse relationship between farm size and credit need in the Deltaic regions of West Godavari district in Andhra Pradesh.

Desai (1988) estimated the credit requirement of a farm using the relationship between the expenditure on materials such as seeds, fertilisers, insecticides and other cash expenses and labour (both hired and family) with the value of output of the crop. The total cash and kind expenditure

of materials and hired labour plus the imputed value of family labour was used to arrive at the financial requirement for crop production.

The study by Ramesha (1990) assessed the production credit requirement of paddy farmers using the cost of cultivation as the base, by keeping .25 per cent of the cost as margin money. Hence, 75 per cent of the cost of cultivation was considered as the credit requirement. The study revealed that the credit requirement was highest on marginal farms followed by large farms and small farms in that order, in Trichur district of Kerala.

Patil and Singh (1991) worked out the short-term capital requirements at recommended level of technology on the basis of input use prescribed by the State Agricultural University (SAU) and the Department of Agriculture. The credit requirement at the existing level of technology worked out to 29.16 and 35.63 percentages respectively of the total capital requirements in the case of local and high yielding varieties. Under the recommended level of technology, it was 57.82 and 51.02 percentages of the total respective capital requirements under local and high yielding varieties, indicating clearly that the technology level influenced the credit requirements of farmers.

Singh and Jha (1971) used a linear programming framework to determine the credit needs of farmers in Delhi. Optimal plans were developed under the existing and acceptable technology with and without capital constraints at the prevailing interest rate. The study illustrated that the borrowings were invariably higher on the high income farms (progressive) as compared to the low income farms (relatively unprogressive). It proved that capital scarcity was more acutely felt by the progressive

farmers, implying that under the current technology, the provision of required amount of credit enabled the high-income, progressive farmers to reap greater relative increased income as compared to the respective low income, less progressive farmers. The study further suggested that in a static framework with existing technology, credit requirements were comparatively higher on the high income farms, but in the dynamic context with all the farmers adopting the acceptable technology, the credit requirements of the low income farms were generally much higher. Thus, the study could highlight the relationship between the technology level and credit needs of a farm.

Oberoi *et al.* (1991) examined credit-capital requirement of the tribal farmers in the Pangi valley of Himachal Pradesh under the existing farm technology. They found that, on an average, credit contributed to just 56.62 per cent of the capital requirements of the sample farms. They estimated the credit needs of the sample farms for optimum farm plan developed by the technique of linear programming which could increase the farm income over the existing situation by 62 per cent.

Kumar *et al.* (1978) employed a profit function approach for the estimation of demand for crop loans by the marginal farmers. The amount of crop loan required was taken as the difference between the working capital requirements during a crop season and the available owned funds in the same period. The study revealed that in all the seasons, the bulk borrowings had been for meeting the cultivation expenses of the most profitable crop of the season. The demand elasticities for credit with respect to input and output prices were found to be highly elastic for

all seasons, but inelastic with respect to interest rate indicating that farmers could pay higher interest on loans, if they could be made available.

A profit function framework was used by Tyagi and Pandey (1982) to estimate the demand for credit in Kurukshetra district of Haryana, and obtained identical findings as above.

However, it may be mentioned in this context that it is obviously impractical for a lending agency which deals with a large number of cultivators to attempt an assessment of the credit requirements of each on a sophisticated basis. Such an approach may result in unfair discrimination or even favouritism in some cases. Production needs may, therefore, be fixed on an average basis. For this purpose, the most convenient method is to fix crop-wise, per-acre scales of finance (Reserve Bank of India, 1972).

Desai and Naik (1971) considered that the extent of adoption of HYVs by farmers and the use levels of recommended inputs and cultural practices were the two factors which affect the level of demand for credit.

Farmers were using more cash inputs for high-yielding varieties, which had increased the cash needs in agriculture by manifold (Sharma and Prasad, 1971).

Singh and Kahlon (1971) assessed the credit requirement of farms in Patiala district of Punjab and found that the credit requirement increased with the size of the farm both under the existing and alternate plans.

Subramanian (1971) reconfirmed that the total requirement of credit increased with the size of farms ( $r = 0.75306^{**}$ ) in Madura district of Tamil Nadu also. But the percentage of credit to total spending was largest

in the small farm group. The credit gap was highest in the small farm group while it was small in medium and large farm groups.

Sharma and Prasad (1971) examined the credit needs of farmers in Rampur district in Uttar Pradesh and found that credit needs at the improved technology, on an average, were 195 per cent higher than credit needs at the current technology. This increase was different in various farm size-groups, highest (349 per cent) on the large farms, followed by the small farms (155 per cent) and the least in the case of medium size farms (144 per cent). The increase in the credit need was about three times more on the irrigated farms than those of the unirrigated farms.

Mehta and Sidhu (1971) examined the nature and magnitude of impact of medium and long-term investments on short-term operational credit requirements of the Ludhiana farmers in Punjab. After examining the tube-well and tractor loanees, they concluded that loans given for long-term investment had significantly increased the requirements of short-term loans.

A study was conducted by Sathyanarayana (1985) in Chittoor district in Andhra Pradesh on the factors determining the working capital requirements using a sample of borrowers from 30 PACS representing all the agro-ecological situations in the district. The study revealed that the working capital requirements were influenced by the size of holding, extent of area under irrigation and the cropping pattern.

The role of credit in the adoption of high yielding varieties of paddy in the West Godavari district of Andhra Pradesh was analysed by Subrahmanyam (1975). It was found that the provision of credit resulted

in the introduction of HYVs of paddy by small farmers, subject to the availability of suitable varieties for the agro-climatic regions and inputs like irrigation. The study also revealed that the credit requirements differed between the different agro-climatic zones due to differences in the cropping patterns and capital base.

The analysis of capital and credit needs showed that even in the existing plans, the farmers needed 76.49 per cent of cash over their owned capital to run the family business successfully. The cash requirements increased further by about 10 per cent when resources were rationalised without purchasing irrigation water, and it almost doubled when resources were rationally budgeted for their use with irrigation purchasing activity. Thus, the optimal plans indicated that the rational use of resources would increase credit requirements substantially. The introduction of new technology and use of new inputs at the recommended level, which are both capital and labour intensive, required an additional amount of capital (Dhawan and Kahlon, 1978). The results conclusively illustrated that for the successful implementation of high yielding variety programme, it required a huge amount of cash to meet the operating expenses of different enterprises.

Babu (1992) scrutinised the interseasonal demand for production credit and its variation across the farm sizes in Thrissur district of Kerala, and found that credit requirement did not vary significantly in the autumn, winter and summer paddy in the study area. However, the credit need varied inversely with the holding size. On an average, the credit need per acre was Rs. 1957, Rs. 1761 and Rs. 1539 for the marginal, small and large farms.

A review of literature presented briefly above clearly highlighted that the level of technology, agro-climate, cropping pattern and extent of irrigation clearly influenced the credit need for crop production. However, the nexus between farm size and credit requirement is not resolved unanimously. Again, the question of clubbing the consumption expenses in the assessment of credit need is also not addressed properly. One such attempt was made by Rao (1962). He argued that the credit requirements for agriculture should take into account not only the credit needs of the agricultural production subsystem as is done presently, but also of the whole agricultural system. He also reiterated that the family labour components should also be included in the scale of finance. Desai (1988) also concurred with the above arguments.

### 2.2b Adequacy of Credit

Unlike the issue of credit need, where a clear consensus has not emerged, there is near unanimity in the issue of credit inadequacy among researchers.

Dhawan and Kahlon (1978) examined the issue of credit adequacy and concluded that the amount of credit supplied by various institutions was not adequate to meet the requirement even at the existing level of technology in Ferozepur district of Punjab. It was observed that there was increasing demand for credit even in the optimal plan developed at the existing level of technology with irrigation purchasing activity. Credit requirement increased by 86.26 per cent over the farm plan's credit requirement without purchasing irrigation, whereas it further increased to 139.17 per cent when the irrigation constraint was relaxed in the analysis.

Reddy (1990) examined the demand and supply gap of credit by size group of holdings of farmers in Karim Nagar district of Andhra Pradesh. He found negative supply-demand gap among the marginal and small, and medium farmers. The gap was more for the marginal and small farmers. The higher per acre demand for credit for this category was accompanied by a lower per acre supply of credit. The per acre supply of credit was higher for the large farmers while their per acre demand was low, resulting in a positive supply-demand gap in credit for this category, highlighting the unequal access of credit among the various size group of holdings and the differing pattern of inadequacies among them.

According to Kahlon (1991), underfinancing resulting from the fixation of low unit cost or sanctioning of inadequate loan amounts by the banks have largely contributed to the rising level of overdues at the farmers' level. The beneficiaries were either forced to raise resources for meeting the differences in actual cost and the loan amount from informal agencies in the event of underfinancing or they had to settle for assets/inputs of poor quality.

A size-wise assessment of credit gap in Thrissur district of Kerala showed that credit gap was more among the small and large farmers as against the marginal farmers. On an average, the marginal farmers could get 45 per cent of their credit requirement from various sources, while the small and large farmers could obtain only 30 and 21 percentages respectively of their credit need (Babu, 1992).

Shollapur (1997) argues that in order to have an effective and smooth credit cycle in co-operative credit system, owned funds should



stimulate adequate deposits and working funds should be effectively utilised fully, without leaving any funds idle. There should be an effective spread-over of the credit and credit development should be recovery-oriented. The amount of credit should be adequate enough to apply it for the desired purpose. Its inadequacy leads to misdirection, thereby defeating the very purpose of credit.

### 2.3 Timeliness of Credit

It is to be appreciated that since capital is the life blood of agriculture, it is not only the quantum of credit disbursed that is important, but also its timing to ensure adequate liquidity when production process is undertaken (Dhawan and Kahlon, 1978; Balishter, 1990). According to Kahlon (1991), the test of sound rural banking lies in timely delivery of credit for well appraised schemes where the amount of financing is adequate for the purpose and repayment schedules are realistically drawn up.

The first official reference to seasonality of credit appeared in the report of the All India Rural Credit Survey Committee (1954) when the committee emphasized the need for providing short-term finance to agriculture on the basis of crop acreages and to synchronise the time of repayment to the harvesting season (Reserve Bank of India, 1954).

The All India Rural Credit Review Committee (1969) observed that seasonality in lending and recovery of loans were generally accepted in states like Andhra Pradesh, Bihar, Gujarat, Jammu and Kashmir, Maharashtra, Mysore and Uttar Pradesh and West Bengal, while others continued the old practice of issuing loans throughout the year and collecting them towards the close of the cooperative year. The committee

emphasised the need for flexibility in implementing the principle of seasonality so as to take the special problems of particular areas into account. For instance, the Committee felt that in states like Punjab where the adoption of short-duration, high-yielding varieties had enabled cultivators to carry on cultivation almost round the year, and in case of perennial crops like coconut which did not involve expenditure on a seasonal pattern and provided a yield throughout the year, it was not practical to insist on the issue and recovery of loans only during specified months of the year. Hence, the Committee recommended the desirability of conducting experiments on the basis of special studies to adopt seasonality to conditions of multi-cropped areas or where crops such as coconut were grown (Reserve Bank of India, 1969a).

Later, the Reserve Bank acknowledged the fact that non-observance of seasonality in the recovery of loans gave rise to the problem of large overdues as the repayments did not coincide with the time, when the majority of the cultivators had no funds with them at the end of 12 months from the date of disbursement (Reserve Bank of India, 1972).

The National Commission on Agriculture (1976) reviewed the Action Programme on Agricultural Credit implemented by the various state Governments and emphasised that the time of disbursement and recovery of agricultural credit should be in line with the seasonality of the agricultural operations (Government of India, 1976).

Bedbak (1985) felt that too much credit or delayed credit to gear an individual's economic conditions was worse than no credit at all. So, he concluded that low cost credit in time and in suitable quantity could

only assist the economically weaker but socially significant sections of the society identified under the priority sector.

An examination of the short-term agricultural credit scheme implemented by the Rajasthan Central Co-operative Bank revealed that the loans were not disbursed in instalments, and there was no proper linkage between advancing and repayment of loans with sowing and harvesting season (Sharma, 1985).

A study of short-term agricultural Co-operative credit in Quilon district of Kerala showed that the delivery of co-operative production credit was influenced by the accounting period than by the cropping period in a seasonal crop like paddy, annual crop like tapioca and even in a perennial crop like coconut. By not ensuring the timeliness of credit, its end utilization could also be not ensured (Babu and Sebastian, 1991).

There seems to be a great misconception at different levels that rural credit should be relatively at a cheaper rate. But, what is more important is the adequacy and timely availability of credit (Singha, 1991).

While evaluating the profitability of crop loans issued by Chaitanya Grameen Bank in Guntur district of Andhra Pradesh, Rao and Satyanarayana (1992) observed that timely sanction of loan was perceived as the single most important reason for the profitable utilization of crop loan by majority of borrowers. Farmers who could not utilize the crop loan profitably ranked delay in the availability of crop loan as the most important reason for the non-profitable utilization of crop loan.

An effective end-use of credit presupposes its timely availability. Credit delayed is much worse than credit denied, as untimely credit is

likely to be diverted for the purposes other than production (Shollapur, 1997).

#### 2.4a Overdues and Socio-Economic Determinants

Overdues are loans and interest thereon not repaid on due dates (Reserve Bank of India, 1989). Credit disbursement is only the beginning of the credit cycle. The cycle will be interrupted if the repayments are not forthcoming (Shollapur, 1997).

The World Bank (1975) traced three general reasons for overdues. The first stemmed from the farmer's failure to use borrowed funds for productive purposes. Secondly, overdues would result from the investment having gone bad rather than a failure to apply the loan proceeds as expected. Causes included bad harvests, natural disasters of various kinds and changes in economic conditions followed by a drop in farm prices. Some loans had been made on the basis of unrealistically favourable assumptions about the results. At other times, the terms of loans were ill-suited for the purpose, e.g., short-term loans for medium-term activities. The third reason for delinquency or default is related not to an inability, but to a refusal to repay. Whether a debtor has the funds to repay a loan is, of course, not always clear-cut. Some funds usually are available and farmers have to establish priorities for their use. Apparently, repaying public sector credit is accorded low priority. In some cases, farmers have the impression that credit is a gift made to ensure their loyalty and future support. Governments do little to change this attitude, and may even encourage it in times of political uncertainty.

Some of the unhealthy results of politicisation in the co-operative credit institutions described vividly by Dandekar (1993) confirms the above

view. It includes interference in the recovery of co-operative dues or promise to write off the dues if elected to power, and determination of interest rates on considerations other than financial returns with an eye on populist appeal. Such actions generate a general psychology of non-repayment, vitiating the recovery climate and jeopardising the financial interest of credit agencies.

Hence, reducing the levels of delinquency and default is the most important issue in seeking to make public sector credit programmes financially viable (World Bank, 1975).

The cause of overdue of co-operative credit in Raipur district of Madhya Pradesh was examined by Muthiah (1970). In the majority of cases, the farm plan was prepared by the societies without consulting the borrowing members. Similarly, in many cases, the fertilizers supplied were not fully applied to the area included in the farm plan fearing that such high dosages of fertilizers might damage the crop, and hence were resold to the traders or big farmers in the area. Such thinning of resources and consequent non-realisation of entire potential resulted in low yields and returns, leading to mounting overdue. The successive crop failures had been the most important among the external factors contributing to heavy overdue. The practice of adjusting outstanding loans from fresh loans compounded the problem. There was over-financing and misuse of credit on a very large scale for non-productive purposes due to non-insistence on kind component.

Bhalerao and Vishwanath (1971) while evaluating the statewide performance of co-operative finance in India by the primary agricultural credit societies during the period from 1960-61 to 1968-69, found that

the position of overdues worsened during the period even in the co-operatively advanced states like Andhra Pradesh, Gujarat, Maharashtra, Karnataka, Punjab and Tamil Nadu. They attributed the laxity in the loaning policy and the loan procedures, lack of effective supervision over the use of loans and the failure of linkage of co-operative credit with marketing to the mounting overdues in these states.

Singh and Kahlon (1971) examined the overdue pattern of agricultural loans in the Mall branch of the State Bank of Patiala during the period December 1969. It was found that the overdues in production credit was 29.91 per cent while it was less than one per cent in investment credit. By July 1970, the overdues in production credit increased to 59.03 per cent while that in investment credit increased to 5.28 per cent.

The various socio-economic factors influencing the repayment of co-operative dues was looked into by Dadhich (1971), in Kota, Pali and Jodhpur district of Rajasthan. It was found that while there was no association between land owned, amount borrowed or level of literacy of the borrower and his repayment performance, there was strong association between repayment and irrigation. Similarly, borrowers belonging to the middle castes defaulted less as compared to the upper and lower caste borrowers. So also, borrowers growing cash crops defaulted less as compared to those who grew non-cash crops. While the users of chemical fertilizers defaulted less as compared to the non-users, borrowers with high dependency on cultivation defaulted less as compared to those with less dependency on cultivation.

The Banking Commission (1972) found that large scale failure of crops on account of floods, droughts, etc. were important cause for

overdues only in those states/areas where these phenomena occurred frequently. In most states, overdues were attributed to indifferent management or mismanagement of societies, unsound lending policies leading to overfinancing or financing unrelated to actual needs, diversion of loans for other purposes, vested interests and group politics in societies and wilful default, lack of adequate supervision over the use of loans by the borrowers and poor recovery effort, lack of adequate control of banks over the primary societies, lack of appropriate link between credit and marketing institutions, failure to take prompt action against wilful defaulters; and uncertain agricultural prices (Government of India, 1972).

Overdues of primary agricultural credit societies were influenced by certain factors, which were broadly categorised into external and internal factors. The external factors were those beyond the control of the beneficiaries and the credit societies such as the agro-climatic conditions, irrigation facilities, cropping pattern and the like. Failure of monsoon, untimely rainfall or excess rains and such other calamities adversely affected agriculture and reduce the capacity of the cultivator-members to repay their dues. Similarly, lack of irrigation facilities resulted in less return from cultivation as compared to returns owing to the presence of such facilities consequently affecting their repaying capacity. The internal factors were those well within the control of the credit societies themselves such as internal resources, organization structure and supervisory arrangements over recoveries (Reserve Bank of India, 1974).

The State Planning Board (1976) while examining the difficulties experienced in the adoption of high-yielding varieties in Kerala observed that the large requirement of capital and inability to meet the same has

been one of the important constraints in the adoption of high-yielding varieties by a large number of sample households. The study also revealed the absence of proper credit planning by PACS, especially in the scheduling of repayments and were crippled by large overdues.

The National Commission on Agriculture (1976) was deeply concerned at the mounting overdues position of the financial institutions. It specifically pointed out that the overdues of the primary agricultural credit societies in India more than doubled from 20 per cent in 1960-61 to 44 per cent in 1971-72. A disquieting feature of the co-operative credit system was that the increasing overdues not only affected the ability of the co-operatives to extend further credit, but also put in doubt the creditworthiness of the co-operatives themselves (Government of India, 1976).

The Study Group of the Committee on Integration of Co-operative Credit Institutions (1977) that examined the working of primary agricultural credit societies in Kerala found wide variation in the recovery performance of short-term agricultural credit among the districts. The recovery to demand varied from 82 per cent in Kottayam district to 48 per cent in Trichur district (Reserve Bank of India, 1977).

The overdues of 86 primary agricultural co-operatives in the command area of the Mahi-Kadana irrigation project in Kheda district in Gujarat was studied by Jayaraman (1978). Among the six independent explanatory variables chosen, three of them, viz., the ratio of net irrigated area to the net cultivated area, the ratio of area under cash crops to the area under all crops, and the ratio of gross cultivated area to the net cultivated area were external to the societies, while the other three,



viz., the ratio of internal resources to working capital, full time secretary and supervision on the affairs of the societies were internal to the societies. Among the external factors, only irrigated area was significant while the internal resources as a size variable was the only internal factor found to be significant. The irrigation facility enabled the cultivators to augment their gross earnings from their land and consequently increased their capacity to repay debt. Similarly, the study illustrated that the large-sized societies with substantial internal resources were able to reduce their overdues by virtue of their wherewithal to deal with the overdues problem adopting improved management techniques.

The Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development (1981) observed that the recovery performance of primary agricultural credit societies showed a deteriorating trend over the period from 1970-71 to 1978-79. The statewise recoveries during 1977-78 in relation to the demand were below the All-India average in Assam, Bihar, Himachal Pradesh, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Tripura, Orissa and West Bengal. Recovery had shown signs of improvement in a few states like Haryana and Kerala only. The recovery of the direct loans to agriculture by commercial banks amounted to 51.2 per cent of demand as on 30 June, 1978. Recovery formed more than 60 per cent of demand only in the states of Haryana, Jammu & Kashmir, Punjab and Kerala (Reserve Bank of India, 1981).

A study by Sathyanarayana (1985) on the pattern of repayment of working capital loans by the members of PACS in Chittoor district in Andhra Pradesh examined the size of holding and repayments in irrigated

as well as rainfed areas. The repayments and farm business income were positively correlated in both rainfed and irrigated areas. However, the size of holding and farm business income were not significantly correlated in rainfed areas, thereby pointing to the role played by irrigation in enhancing the farm business income and thereby improving the repayments in that process.

Goyal and Pandey (1987) conducted a multiple linear regression analysis to identify the factors affecting the overdues of Primary Agricultural Co-operative Credit in Hissar district of Haryana. It was found that the outstanding loan size and percentage of consumption expenditure to total expenditure had a positive impact in reducing the overdues while the percentage of earning adults to total adults had a negative relationship with the repayment pattern. It meant that a reduction in the proportion of earning adult members in the farm household increased the chances of overdues.

The influence of socio-economic factors of borrowers on co-operative overdues was examined by Anandam and Namasivayam (1988) in Ramanathapuram district of Tamil Nadu. It was found that there was no relationship between caste, land holding size, amount borrowed and repayment of overdues. However, there was a strong relationship between education, age, irrigation and occupation of the borrowers and repayment of dues.

The study by Desai *et al.* (1988) in the semi-arid tropical areas of Andhra Pradesh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh illustrated

that the delinquency rate of agricultural subsystem credit from co-operatives were negatively associated with the degree of agricultural progress.

The Khusro Committee (1989) that reviewed the agricultural credit system in India observed that while the overdues of primary agricultural credit societies and regional rural banks increased from 34 per cent and 48 per cent in 1975-76 to 41 per cent and 51 per cent respectively in 1985-86. The overdues of commercial banks came down from 48 per cent to 43 per cent during the corresponding period. There existed considerable regional variation in the overdue pattern of all types of credit institutions. The committee's finding was that the phenomenon of overdues was generally neutral to the category of borrowers financed and various farm sizes (Reserve Bank of India, 1989).

The Khusro Committee (1989) also assessed the borrowers' perception of the causality of defaults by interviewing 1013 defaulters across different types of credit agencies. It identified inadequate income generation, crop failure due to weather and unforeseen development in the household as the major factors resulting in loan default. However, the largest percentage of respondents, i.e., 54.7 per cent defaulters to commercial banks, 52 per cent defaulters to PACS and 12.4 per cent defaulters to RRBs and 54.4 per cent defaulters to PLDBs did not indicate any specific reason which compelled them to default in repayment of dues to the credit agencies (Reserve Bank of India, 1989). Hence, the Committee observed that some of these cases could be cases of wilful defaults.

A study by Balishter (1990) revealed that about 72 per cent of the total overdues of commercial banks were 'old' overdues (over 3 years)

and only 28 per cent were 'current' overdues (less than 3 years). A size-groupwise analysis showed that the extent of old overdues was about 60 per cent in case of small farmers, 71 per cent in case of medium farmers and about 77 per cent in case of large farmers. It was a little disturbing to note that the extent of old overdues grew with the increase in farm size.

Balishter *et al.* (1990) conducted a sector-wise and category-wise analysis of IRDP loan overdues in Etah district of Uttar Pradesh, covering 150 borrowing families during the year 1983-84. The overdues for agricultural loans were higher (32.36 per cent) than non-agricultural purpose (14.87 per cent). This difference was more on account of the poor quality of asset created in the agricultural sector. The extent of default was higher in the case of marginal farmers as compared to small farmers and landless labourers, accounting for 47, 34 and 19 percentages of the total overdues respectively. The average amount of overdue per defaulting family was Rs. 346, and it varied among small (Rs. 390), marginal (Rs. 455) and landless labourers (Rs. 224). They concluded that the reason for the poor performance of the marginal farmers over the landless labourers was due to low farm income and low income from wage employment thereby attributing the better performance of the landless labourers due to continuous flow of income rather than the level of income.

Krishnan (1990) examined the recovery performance of the South Malabar Gramin Bank in Kerala from 1980 to 1987, and found that the recovery percentage to demand has declined from 83 per cent to 76 per cent during the period under consideration. Scheme-wise analysis showed that eventhough recovery performance in the case of crop loan was one

of the highest, it was exhibiting a declining trend over the years from 74 per cent during 1980 to 67 per cent to demand during 1987.

Singh *et al.* (1990) attempted to identify the factors influencing overdues of agricultural loans in Agra district of Uttar Pradesh by commercial banks using a multiple linear regression equation. It was found that the amount borrowed, amount of loan put under non-productive use and repayment capacity were statistically significant factors influencing overdues in the study area. All the three variables had positive sign.

The factors influencing the overdues of co-operative and commercial bank credit to agriculture using borrowers' perception was done by Lakshminarayana and Adinarayana (1990) in Visakhapatnam district of Andhra Pradesh. It was seen that 33.33 per cent borrowers of co-operative credit and 29.03 per cent borrowers of commercial bank credit considered inadequacy of credit as the major factors resulting in overdues. The next prime reasons were assigned to heavy family consumption expenses, misuse of loan and disguised unemployment.

Sundaram (1991) attributed the major causes for the mounting overdues of agricultural loans to absence of linkages and supportive services, purchase of sub-standard assets at inflated prices when selected asset item is short in supply, diversion of funds for unexpected household consumption expenditure, high concentration of a single activity thereby reducing marketability, reluctance of borrower's to repay the defaulted amount under the wrong impression of non-renewal of loans, and inadequate supervision and follow-up by bank staff.

According to Rajasekhar and Vyasulu (1991), overdues at the level of 10 to 15 per cent will not normally lead to fund flow problems as

the half-life of credit is very long. The half-life of credit is the time required, *ceteris paribus*, in months, for Rs. 100 devoted to rural lending to be eroded by 50 per cent due to overdues. The half-life simulation exercises illustrated that 10 per cent overdues that stemmed from ordinary risks of business which banks could absorb if they are functioning with an average level of efficiency.

An evaluation of the priority sector advances of commercial banks by Parmar and Patel (1994) in Valsad and Surat districts of Gujarat showed that the recovery per cent to demand varied from 30 per cent to 59 per cent. The analysis of variance revealed that the performances of the banks with respect to recovery varied significantly. The ratio of earning members to total, number of follow-up visit and the total advance outstanding per staff explained 95 per cent of the total variation in recovery in Valsad district. However, the number of follow up visit by bank officials turned out to be the single most important factor contributing to improvement in recovery in Surat district, accounting for 75 per cent variation in recovery performance.

The factors affecting the repayment pattern of agricultural loans issued by the South Malabar Gramin Bank in Kozhikode district of Kerala was analysed by Kumar (1991). It was found that failure of crop was the most important factor that resulted in non-repayment of loans. This was followed by fall in product price and increased family consumption. The association of credit repayment and the socio-economic factors were tested using chi square analysis, and it was observed that level of education and repayment were significantly associated for agricultural labourers and small farmers. However, education and repayment were not significant

in the case of marginal farmers. Other socio-economic factors like land holding size and income levels were not related to the repayment behaviour of borrowers for all the above categories.

Singh and Mruthyanjaya (1992) while examining the relationship between credit utilization and overdues of small and marginal farmers in Aligarh district of Uttar Pradesh, found that on an average, 70 per cent of the crop loan was utilized for crop production. The extent of diversion was more among the marginal farmers as compared to the small farmers. So also, the extent of current overdues was more or less equal to the diversion of crop loan to other purposes in all the cases.

Singh *et al.* (1994) examined the institutional credit provided in Azamgarh district of Uttar Pradesh during 1991-92 and the main outcome of the study was that overdues of agricultural loans increased mainly because of the weak and unstable financial condition of the farmers. It was pointed out that the farm credit institutions followed the traditional credit need approach with high interest rate which resulted in poor recovery position.

Khatkar *et al.* (1994) examined the agricultural overdues in Haryana during 1981-82 to 1990-91. They observed that the agricultural overdues have risen faster than the loans advanced during the period of study (13.62 and 6.76 percentages respectively per annum) for the PACS in Haryana. They recommend the avoidance of underfinancing, political interference, better supervision to prevent diversion of funds, and legal support to curb the tendency of wilful default to overcome the problem of mounting overdues.

Ajjan (1994) analysed the overdue position of co-operative credit institutions in Tamil Nadu from 1982-83 to 1991-92. The overall

percentage of overdues continuously declined from 46 per cent to 35 per cent during the reference period. However, in the case of Primary Agricultural Co-operative Banks (PACBs), the overdues increased to 259 per cent, during the corresponding period, thereby highlighting the inter-institutional differences in the recovery performance in the same region under similar macroeconomic environment prevailing.

Sivaprakasam (1996) analysed the socio-economic and political factors influencing the repayment of short-term co-operative agricultural credit in Dindigul Anna district of Tamil Nadu. He found that 80 per cent of the defaulters were in the age group of 40 years and above, and found a tendency of young borrowers to default less. Similarly, men heads of family had a tendency to default more often as compared to women heads of family. However, the level of education was neutral to repayment pattern. Whereas 14.4 per cent of big farmers defaulted, it was as high as 45.6 and 40 percentages for the marginal and small farmers respectively. It was also found that affiliation to political parties increased the chances of default.

An analysis of the overdue pattern of the Puthur Service Co-operative Bank in Trichur district of Kerala by George and Babu (1996) illustrated that the percentage of overdues has been steadily increasing from 1982-83 to 1991-92. The withdrawal of the interest subsidy scheme during 1989-90 pushed up the overdues dramatically. On an average, the overdue on short-term loans constituted 34.98 per cent to demand, while it was 32.60 per cent to demand for medium term loans. The overdue per borrowing member increased from Rs. 782.80 during 1992-83 to Rs. 858.15 during 1991-92.



The loan delinquency problem is not peculiar to India. La Due (1990) while reviewing the Farmers Home Administration (FmHA) programme in the United States reported that many borrowers there thought that defaulting on the government is not a serious transgression, rationalizing that the government got them into the problem either through inappropriate price support policies or by lending the money. Neighbours and friends frequently thought non-payment to the government as less sinful than not saying local individuals or local business owned and operated by people they knew. The FmHA, on their part, were hesitant to take actions that were viewed as politically unpopular, and borrowers exploited the situation by bringing political pressures, multiple levels of appeal and extensive use of legal recourse. Incomplete assessment of repayment ability, inadequate verification of income and debt, and imperfect documentation of collateral were also found to result in more loan delinquencies.

#### 2.4.b Wilful and Non-wilful default

Generally, default occurs when the borrower does not have enough cash on hand to make the required payment on his loan, i.e. non-wilful default (Leathers and Chavas, 1986). However, default occurs even when the borrower possesses the financial ability to repay the loan, but does not do so because he is not willing to honour the contract, i.e. wilful default (Anderson *et al.*, 1989).

Dadhich (1971) examined the reasons for wilful default of co-operative credit in Kota, Pali and Jodhpur districts of Rajasthan by covering 120 defaulters. The main causes of wilful default identified were four. They were the re-lending of co-operative borrowing for profit due to the

difference in the interest rate prevailing in the area and the rate charged by the co-operatives, ex-members and their associates defaulting to harass the present management, uncertainty of fresh finance to the society by the central financing agency, and due to element of fear about the future financial position of the society members wilfully defaulting upto the extent of their share capital and deposits with the society. The study also revealed that the wilful defaulters were generally farmers with larger size of holdings, belonging to higher caste groups, with better level of education, and members or ex-members of management committee with larger borrowing amounts.

The RBI Study Team on Overdues of Co-operative Institutions (1974) observed that out of a total Rs. 377 crores of overdues at the primary level, the wilful default accounted for Rs. 277 crores, which worked out to more than 73 per cent of the total overdues. Another aspect of the problem was that there was hardly any distinction between small and big farmers in the context of wilful default (Reserve Bank of India, 1974).

Mohan *et al.* (1985) employed the Bayes' theorem in its discrete form to work out the posterior probabilities of becoming a wilful and non-wilful defaulter of cooperative production credit in Thanjavur district of Tamil Nadu. The study revealed that larger farm size, higher farm and consumption expenses, and high educational and caste status were associated with a higher probability of wilful default. On the other hand, smaller size of holdings, low educational and caste status resulted in a higher probability of non-wilful default in the study area.

A study conducted in Uttar Pradesh by Balishter (1990) revealed that the proportion of wilful defaulters was as high as 81 per cent. It

further revealed that about 66 per cent small farmers, 94 per cent of medium farmers and almost cent per cent large farmers were wilful defaulters. More alarming was the fact that the wilful defaulters knew how to connive, manipulate and influence the officials of the lending institutions. They were also found to instigate others not to repay on the assurance of helping in case of any difficulty in the event of such default.

Rajasekhar and Suvarchala (1991) feel that there has been a significant change in the nature of overdues during the 1980s. While many of the overdues of the early 1980s were on account of non-wilful defaults, those in the late 1980s have essentially the result of wilful defaults. Both legitimate and illegitimate political intervention in the functioning of the credit delivery system through the loan melas, and in the sanctioning of the loans under government sponsored schemes have marginalised the bankers. They consider the Agricultural and Rural Debt Relief Scheme, 1990 of the National Front Government as politically legitimate, but disastrous in banking terms.

#### 2.4c Repayment Behaviour of Farmers

The review of literature presented above clearly indicated that there was an extensive literature on overdues and socio-economic determinants influencing repayment. However, a scrutiny of these works indicate that the factors influencing repayment and the recovery climate varied widely across regions and time. Similarly, the use of socio-economic characteristics in screening the successful use of credit is an important area of research in rural credit because it helps to distinguish a potential defaulter from

a non-defaulter. Hence, it is pertinent to review such works that were carried out in India and abroad.

It was Krause and Williams (1971) who used personality characteristics for the first time to identify and appraise farm operators' and entrepreneurs' potential to successfully use farm credit. Personality variables like risk aversion, scientific orientation, manifest anxiety, adaptability, vocational interest, aggressive conservatism etc. were found to have a significant influence on the successful use of credit by farm families. However, they were in favour of using non-personality variables like physical production and financial variables also to have a better distinction between safe and high risk ranges of credit use.

The study by Dunn and Frey (1976) attempted to develop a better loan evaluation technique whereby prediction of successful loan to grain farmers in Illinois was made using a multiple discriminant analysis. The ratio of total liabilities to total assets, the amount of credit life insurance, the amount of original loan as a proportion of net cash farm income, and the number of acres owned were found to be the significant characteristics distinguishing successful use of credit.

Using cross-section data from borrowers of co-operative credit societies, Pandey and Muraleedharan (1977) illustrated that the amount of loan put under production purposes, the percentage of incomes from sources other than crop production to the total income, percentage of cash expenditure to the total expenditure, and per capita consumption expenditure were the major characteristics that discriminated between defaulters and non-defaulters of co-operative credit in Banda district in Uttar Pradesh.

Chand and Sidhu (1985) in their study identified the ratio of dependents in the family, capital expenditure on the farm, total borrowings made, and the level of education of the farmers as capable of discriminating potential defaulters of institutional loan in Ludhiana district of Punjab.

Kalyankar and Rajmane (1987) employed a linear discriminant function to distinguish between a wilful and non-wilful defaulter of co-operative crop loan borrower in Parbhani district of Maharashtra. The study revealed that operational holding size, proportion of cash crops to total cropped area, family consumption expenditure, gross agricultural income and initial amount of loan could be used with sufficient discriminating power.

Dhayani and Tewari (1988) used the discriminant analysis of commercial bank crop loan borrowers in Rampur district of Uttar Pradesh to predict good and bad risks in agricultural production credit. Farming efficiency measured as the ratio of gross farm expenses to gross farm income, behavioural characteristics, regularity of borrower in bank customership, other outstanding debts in the year, per acre value of farm assets including land, and social status of the borrowers were found to be effective discriminant characteristics capable of classifying a production credit into a good or bad risk one. The results suggested that higher farming efficiency and greater employment of farm assets per unit of land made a prospective borrower a good credit borrower. Behavioural characteristics such as poor attitude towards savings, loans and indebtedness, litigating attitude, lack of entrepreneurship and subsistence motive towards farming; irregularity in bank customership; other outstanding debts and higher social status in terms of belonging to the

higher caste, higher educational attainments, political influence etc. made a prospective borrower a credit risky one.

Prasad and Achoth (1992) used discriminant analysis to screen the applicants of IRDP loans in Anantpur district in Andhra Pradesh. The features that distinguished the defaulters from the non-defaulters in the study area were productive expenditure, productive assets, loan instalment and quantum of loan.

The foregoing studies clearly indicated that the loan characteristics that distinguished a potential defaulter from a non-defaulter also varied across the states and farming systems. This underlines the need for developing a repayment prediction model for states on a location-specific manner. The present study is intended to bridge this information gap because no such work has so far been reported for the state of Kerala.

## Chapter III

### DESCRIPTION OF THE STUDY AREA

As the present study pertains to Kottayam district of Kerala State, it will be pertinent to have a brief profile of the state and the study area, which may provide the background against which the performance of sample farms and credit characteristics of the farmers are to be examined.

#### 3.1. Kerala

Kerala state is situated at the South-West corner of the Indian peninsula between 8° 18' and 12° 48' North latitudes and 74° 52' and 77° 22' East longitudes, as a narrow strip of land, 32 to 130 km wide, between the Western Ghats in the East and the Arabian Sea in the West. It has a geographical area of 38863 Sq. Kms and a coastal line of 580 km in length. It accounts for 1.18 per cent of India's land surface area, and accommodates 3.44 per cent of her population (Registrar General and Census Commissioner, 1991 a).

The land resources is highly diversified in its physical features and agro-ecological conditions with the undulating topography ranging in altitude from below mean sea level (MSL) to 2694 m above MSL. Based on the topography, the land resources have four well-delineated natural divisions, viz., the low land (< 7.5 m from MSL), the midland (7.5 to 75.0 m above MSL), the highland (75 to 750 m above MSL), and the high ranges (750.0 m above MSL), each running almost parallel in the North-South orientation (Kerala Agricultural University, 1989).

The state ranks first among Indian states in literacy with a literacy rate of 89.81 per cent, as against the national average of 52.21 per cent (Registrar General and Census Commissioner, 1991b). The male and female literacy rates are 93.6 and 86.17 percentages respectively, exhibiting very little disparity as against the All-India average of 64.13 and 39.29 percentages respectively. Similarly, the life expectancy of 72 years at birth is also the highest in the country against 61 years at the All-India level. Kerala's infant mortality of 13/1000 is also the lowest in India while the national average is 72/1000 (Government of India, 1997). The better quality of life is indicative of the well-developed social sector, giving rise to a "Kerala Model of Development" (Kannan, 1990) which is comparable to any developed Asian country (Government of India, 1997) (Table 3.1.1).

Table 3.1.1 Indicators of Human Development

Country	Life expectancy at birth	Infant Mortality rate (per thousand births)	Adult literacy (per cent)
China	68.9	43	80.9
Indonesia	63.5	53	83.2
India	61.3	72	52.2
Kerala state (India)	72.0	13	89.8
Malaysia	71.2	12	83.0
Philippines	67.0	36	94.4
Pakistan	62.3	80	37.1
Republic of Korea	71.5	10	97.9
Singapore	77.1	5	91.0
Sri Lanka	72.2	16	90.1
Thailand	69.5	29	93.5

(Source : Government of India, 1997)



### 3.1.1. Sectoral Share in the Net Domestic Product

The share of the primary sector (agriculture and allied activities) in the net domestic product (NDP) of the state was 39.2 per cent during 1980-81 at the current prices. It has come down to 34.5 per cent by 1996-97. The share of the secondary sector also declined during this period while the tertiary sectors has increased during the corresponding period (Table 3.1.2). In real terms, the share of the primary sector showed declining trends, while that of secondary (industry) and tertiary (services) sectors showed increasing trends over the years.

Table 3.1.2. Sectoral Share in the Net Domestic Product

Sector	1980 -81	1990 -91	1991 -92	1992 -93	1993 -94	1994 -95	1995 -96	1996 -97
<b>At Current Prices</b>								
Primary	39.2	38.9	39.3	36.0	33.3	32.9	37.6	34.5
Secondary	24.4	26.4	24.8	26.1	27.2	27.4	23.1	23.2
Tertiary	36.4	40.7	35.9	37.9	39.5	39.7	39.3	42.3
Total	100.0	100.00	100.0	100.0	100.00	100.00	100.00	100.00
<b>At Constant Prices (1980-81)</b>								
Primary	39.2	35.9	36.4	34.2	38.8	32.3	33.7	31.4
Secondary	24.4	24.0	23.8	25.6	24.8	25.2	24.1	24.8
Tertiary	36.4	40.1	39.8	41.2	41.4	42.5	42.2	43.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source : Government of Kerala, 1996; Government of Kerala, 1998a)

### Climate

The state experiences a warm humid tropical climate. The mean temperature ranges from 23°C in the cooler months to 33°C in the hot

spells, the coolest months being December-January and the hottest months March-May. The mean relative humidity ranges from 70-85 per cent, January-March being the dry months and May-November the humid.

The state as a whole experiences megathermal climate, which indicates that the crop growth is not inhibited by temperature - but governed by rainfall alone (Kerala Agricultural University,1989).

### 3.1.3. Rainfall

The state receives a mean annual rainfall of around 3000 mm from the South-West monsoon from June to August and North-East monsoon from September to November (Table 3.1.3). The average rainfall during 1997 was 3206 mm which was a normal monsoon year (Government of Kerala, 1989a)

Table 3.1.3. Monthly Rainfall in Kerala during 1994-96

	(mm)				
Month	1994	1995	1996	1997	Mean
January	32.5	11.0	12.6	2.1	14.6
February	31.0	7.2	8.4	3.8	12.6
March	20.3	41.3	13.5	37.5	28.2
April	145.7	173.6	134.4	62.9	129.2
May	151.9	348.5	71.0	134.0	176.4
June	836.2	531.8	592.1	551.0	627.8
July	941.0	719.8	680.0	941.9	820.7
August	478.9	458.2	337.0	520.4	448.6
September	205.8	293.2	329.4	291.0	279.9
October	448.5	208.2	320.6	284.5	315.5
November	163.7	180.6	97.2	284.7	181.6
December	42.5	0.1	88.4	92.7	55.9
Total	3497.9	2973.5	2684.6	3206.5	3090.6

(Source : Government of Kerala, 1998a)

The rainfall follows a bi-modal pattern with the peak of South-West monsoon occurring in June, and the peak of North-East monsoon in September (Fig. 3.1).

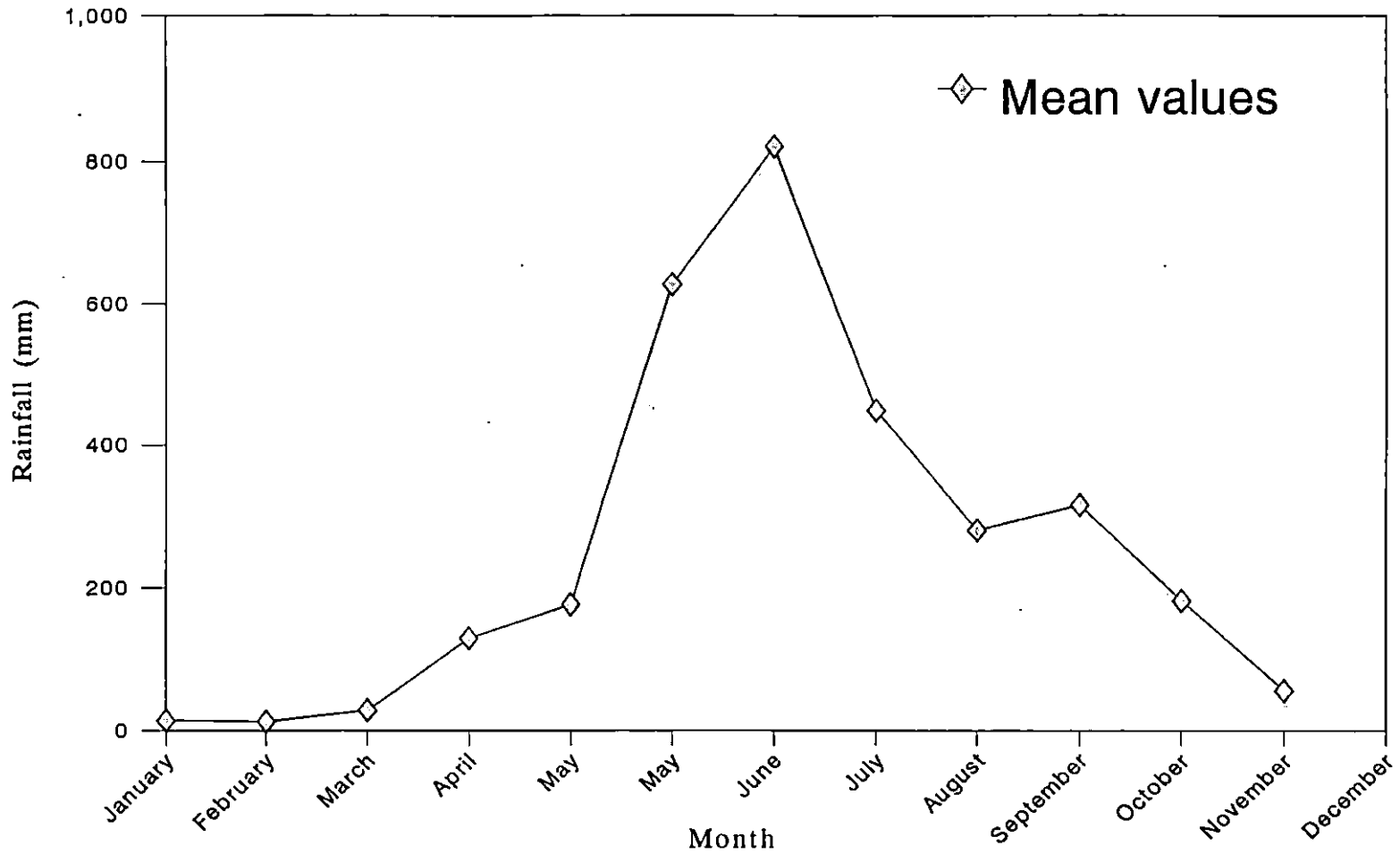
In a state like Kerala where perennial crops dominate, the spread of the rainfall through out the year particularly during the summer months is more critical in deciding the agricultural fortunes (Government of Kerala, 1996).

### 3.1.3. Soils

The major soil types of Kerala are laterite (*oxisol*), red loam (*alfisol*), coastal alluvium (*entisol*), riverine alluvium (*entisol*, *inceptisol*), saline hydromorphic (*alfisol*), brown hydromorphic (*alfisol*, *inceptisol*), Kuttanad alluvium (*entisol*, *inceptisol*), Onattukara alluvium (*entisol*), black soil (*vertisol*) and forest loam (*mollisol*, *alfisol*). The laterite soils are the major soil type, covering about 65 per cent of the total area. The state provides an ideal setting for laterisation with the rainfall, temperature and humidity pattern prevailing.

### 3.1.4. Irrigation Potential

Irrigation is the most critical input for increasing the productivity of crops. Out of a gross cropped area of 30.67 lakh hectares, 4.65 lakh hectares is irrigated in Kerala, which works out to a meagre 15.16 per cent of the gross cropped area (Government of Kerala, 1998a). A basic constraint experienced by the rainfed production environments is the uncertainty and variability in the total annual rainfall and its seasonal distribution. Irrigation reduces this uncertainty and risk involved to a considerable extent.



**Fig. 3.1. Monthly rainfall pattern in Kerala**

Eventhough the period from December to April characterises the period of lowest rainfall, irrigation needs are less for December and January months because they are comparatively cooler months having lower evapo-transpiration. However, the months from January to April being dry months, and keeping the megathermal climate of the state in mind, irrigation is required during the period from February to April.

Kerala is a land of rivers and backwaters. She has got fourty four (41 west-flowing and 3 east-flowing) river resources. However, being monsoon fed, most of them practically turn into rivulets in the summer months. It underlines the need for an efficient water harvesting system whereby the run-off during the rainy season is harvested to be recycled during the dry months to impart resilience to the crops from periodic droughts.

### 3.1.5 Population Density

Kerala is one of the most densely populated states in India. The density per square km is 747/sq.km (Table 3.1.4) while it is only 274/sq.km for the country as a whole (Government of India, 1995). This has been exerting tremendous pressure on the limited land resource base against a steadily declining per capita land availability, especially from the seventies onwards.

### 3.1.6. Distribution of Working Population

Of the total working population of 8.30 lakhs in the State, only 25.54 per cent are agricultural laboures (Table 3.1.5). This is understandable when viewed against the fact that the cropping pattern is dominated by perennial cash crops which are less labour intensive. The

Table 3.1.4. Population Density and Land per Capita in Kerala

Year	Density per sq.km (No)	Land per capita (ha)
1901	165	0.60
1911	184	0.54
1921	202	0.49
1931	245	0.41
1941	284	0.35
1951	349	0.28
1961	435	0.23
1971	549	0.18
1981	654	0.15
1991	749	0.13

(Source : Government of Kerala, 1994)

Table 3.1.5. Distribution of Farm Population in Kerala

Sl. No.	Particulars	Total	Rural	Urban
1.	Total workforce	8,301,087 (100.00)	6,176,865 (74.41)	2,124,22 (25.59)
2.	Cultivators	1,015,983 (12.24)	931,989 (91.73)	83,994 (8.27)
3.	Agricultural labourers	2,120,452 (25.54)	1,887,758 (89.03)	232,694 (10.97)

(Source : Registrar General and Census Commissioner, 1991b)  
 Figures in parentheses indicate percentage to the respective total

labour intensive food crops like rice, cassava etc. have been continuously losing their acreage due to high wage rate and declining relative profitability (Babu *et al.*, 1993). The labour force are thus increasingly being compelled to turn to the non-farm sector for employment opportunities.

### 3.1.7 Distributional Pattern of Operational Holdings

The average size of operational holdings in Kerala is only 0.33 ha as against the national average of 1.57 ha. Nearly 93 per cent of the holdings are of size below one hectare (Table 3.1.6). The small and marginal farmers together accounted for 97.79 per cent of the total number of operational holdings against 77.96 per cent for the country as a whole. Similarly 70.39 per cent of the area operated belonged to the small and margined farmers against the All India pattern of 32.79 per cent, indicating their overwhelming presence in the agricultural production scenario of the state.

The high population density coupled with small operational holdings have led to the evolution of a special food production system in the state, viz., the homegarden agriculture (syn. homestead farming). It is a household level food production system practised around the home with a multi-species of annual and perennial crops along with/or without livestock, poultry and/or fish for the purpose of meeting the fundamental requirements of the household, viz., food, fodder, fuel, timber, mulch and medicare, and also to generate additional income through the sale of surplus to purchase the items that are not obtainable, readily available, or affordable to be produced in the homesteads (Fernandes and Nair, 1986; Ninez, 1987 and Salam *et al.*, 1995). This traditional household level food production system has resulted in an intensive land use system aimed at deriving the maximum benefit out of the limited land resource base both spatially and temporally. The agricultural production base of Kerala is characterised by the predominance of homestead farming. Major crops like coconut, arecanut, cassava, banana, pepper etc. are raised mostly under the homestead situation.

Table 3.1.6. Distributional Pattern of Operational Holding and Average Size by Size Groups

(as per 1990-91 Agricultural Census)

Sl. No.	Size Group	Area operated (million ha)		No. of operational holdings (million Nos.)		Average size of holding (ha)	
		Kerala	India	Kerala	India	Kerala	India
1.	Marginal (below 1ha)	0.88 (49.16)	24.62 (14.87)	5.02 (92.62)	62.11 (58.99)	0.18	0.40
2.	Small (1-2 ha)	0.38 (21.23)	28.71 (17.34)	0.28 (5.17)	19.97 (18.97)	1.36	1.44
3.	Semi-medium (2-4 ha)	0.25 (13.97)	38.35 (23.16)	0.098 (1.81)	13.91 (13.21)	2.59	2.76
4.	Medium (4-10 ha)	0.11 (6.15)	45.05 (27.20)	0.02 (0.37)	7.63 (7.25)	5.38	5.90
5.	Large (10 ha & above)	0.17 (9.50)	28.89 (17.45)	0.003 (0.06)	1.67 (1.59)	58.00	17.33
Total		1.79 (100.00)	165.60 (100.00)	5.42 (100.00)	105.29 (100.00)	0.33	1.57

Source : CMIE, 1996



### 3.1.8 Land Use Pattern

With a high rainfall distribution and population density, every inch of the land in the state is put to appropriate use with little or negligible barren and uncultivable land or culturable waste (Table 3.1.7)

Table 3.1.7. Land Use Pattern in Kerala during 1995-96

Sl. No.	Parameters	Area ('000 ha)	As percentage to the total Geographical area
1.	Geographical area	3885.50	100.00
2.	Forest	1081.51	27.83
3.	Land put to non-agricultural uses	313.13	8.06
4.	Barren & uncultivable land	43.15	1.11
5.	Permanent Pastures & other grazing land	1.17	0.03
6.	Land under tree crops and not included in the net area	26.85	0.69
7.	Cultivable waste	74.38	1.91
8.	Fallow other than current fallow	29.14	0.75
9.	Current fallow	51.31	1.32
10.	Net area sown	2264.84	58.29
11.	Area sown more than once	802.29	20.65
12.	Total cropped area	3067.14	78.94
13.	Cropping intensity	-	135.42

(Government of Kerala, 1998a)

The percentage area kept under agricultural purpose is nearly 79 per cent. It is probably the highest in country. The cropping intensity of 135 per cent is also indicative of the intensive land use pattern despite the dominance of perennial crops in the cropping pattern.

### 3.1.9 Cropping Pattern

The cropping pattern of Kerala is highly diversified and includes food as well as non-food crops.

Eventhough the cropping pattern consists of more than 20 crops, hardly a dozen crops occupy more than 1 per cent of the total cropped area. Coconut occupies the highest share in the total cropped area (29.81 per cent ). This is followed by rice (15.36 per cent), rubber (14.64 per cent, pepper (6.26 per cent), Tapioca 3.71 per cent and cashew (3.37 per cent) in that order. Crops like banana, arecanut and coffee occupy around 2 per cent of the total cropped area while tea and cardamom occupies around one per cent cropped area. The rest of the crops occupy less than 1 per cent of the gross sown area (Table 3.1.8).

### 3.1.10 Labour Wages

The workforce in Kerala is much better off than their counterparts elsewhere in the country. The labour force, by virtue of their better organisational strength and bargaining power enjoys one of the highest wage rate in the country (Table 3.1.9).

It is more than one and half times that of the average daily wages of agricultural labour in the neighbouring state of Tamil Nadu, and more than twice that of their counterparts in Karnataka and Andhra Pradesh.

### 3.1.11 Financial Institutions

Financial institutions play a vital role in mobilising and deploying resources needed for the economic development. There were 1591 PACS, 2268 branches of commercial banks and 269 branches of Regional Rural

Table 3.1.8. Cropping Pattern in Kerala during 1995-96

Sl. No	Crops	Area ('000ha)	As percentage to the gross cropped area
1.	Rice	471.15	15.36
2.	Jowar	5.45	0.18
3.	Ragi	2.03	0.07
4.	Other millets	3.17	0.10
5.	Pulses	20.99	0.68
6.	Sugarcane	5.62	0.18
7.	Pepper	191.60	6.26
8.	Ginger	12.93	0.42
9.	Turmeric	3.97	0.13
10.	Cardamon	44.25	1.44
11.	Arecanut	70.90	2.31
12.	Banana*	72.86	2.38
13.	Cashewnut	103.28	3.37
14.	Tapioca	113.60	3.71
15.	Sweet potato	1.80	0.06
16.	Groundnut	12.99	0.42
17.	Sesamum	6.26	0.20
18.	Coconut	914.37	29.81
19.	Rubber	448.99	14.64
20.	Coffee	82.35	2.68
21.	Tea	36.78	1.20
22.	Others	441.80	14.40
	<b>Total cropped area</b>	<b>3067.14</b>	<b>100.00</b>

(Source : Government of Kerala, 1998a)

\* Includes Nendran and other plantains

Table 3.1.9. Daily Agricultural Wages in India : 1993-94

Sl. No.	State	Daily Average Wages (Rs)
1.	Andhra pradesh	37.63
2.	Assam	54.27
3.	Bihar	42.94
4.	Gujarat	63.20
5.	Haryana	97.43
6.	Himachal Pradesh	57.90
7.	Karnataka	34.69
8.	Kerala	76.99
9.	Madhya Pradesh	39.74
10.	Maharashtra	50.70
11.	Orissa	43.75
12.	Punjab	107.15
13.	Rajasthan	55.54
14.	Tamil Nadu	45.76
15.	Uttar Pradesh	57.19
16.	West Bengal	46.79

(Source : Government of India, 1997)

Banks in Kerala during the year 1996-97 (Government of Kerala, 1998). Kerala is a developed state in terms of the banking infrastructure. As a detailed analysis of the agencies are to be done in chapter V, those details are not being discussed here. However, the examination of the credit deposit ratio (CDR) of the State presents a very disquieting feature of steadily declining CDR over the years (Table 3.1.10). The Reserve Bank has taken a serious view of this situation and the Avari Committee has proposed a CD ratio of 60 per cent to be attained by 2000-2001 A.D.

Table 3.1.10 Credit Deposit Ratio of Banks in Kerala

(at March end)

Year	CDR (%)
1990	58.7
1991	59.0
1992	51.0
1993	48.0
1994	43.1
1995	44.7
1996	44.4
1997	45.5

(Source : State Level Banker's Committee, Trivandrum)

The foregoing features clearly illustrates that the agrarian economy of Kerala exhibits certain uniqueness that distinguishes it from her sister states of India. The high density of population, rainfall distribution, wage rate structure, highly literate and trade-unionised peasantry and labour force, and the predominance of fragmented and extremely small land holding pattern give an entirely different picture. Obviously, the ethos of farming in Kerala is quite different from that of Indian agriculture as a whole.

### 3.2. Kottayam District

Kerala state has been divided into 14 administrative districts, and Kottayam is one among them. It is situated in the south-central part of Kerala bound by Ernakulam district on the northern side, Pathanamthitta district on the southern side, Idukki district on the eastern side and Alappuzha district on the western side (Fig. 3.2). The district has an area of 2203 square kilometers, and comprises of 11 Block, 5 Taluks (*tehsils*) and 75 Revenue villages.

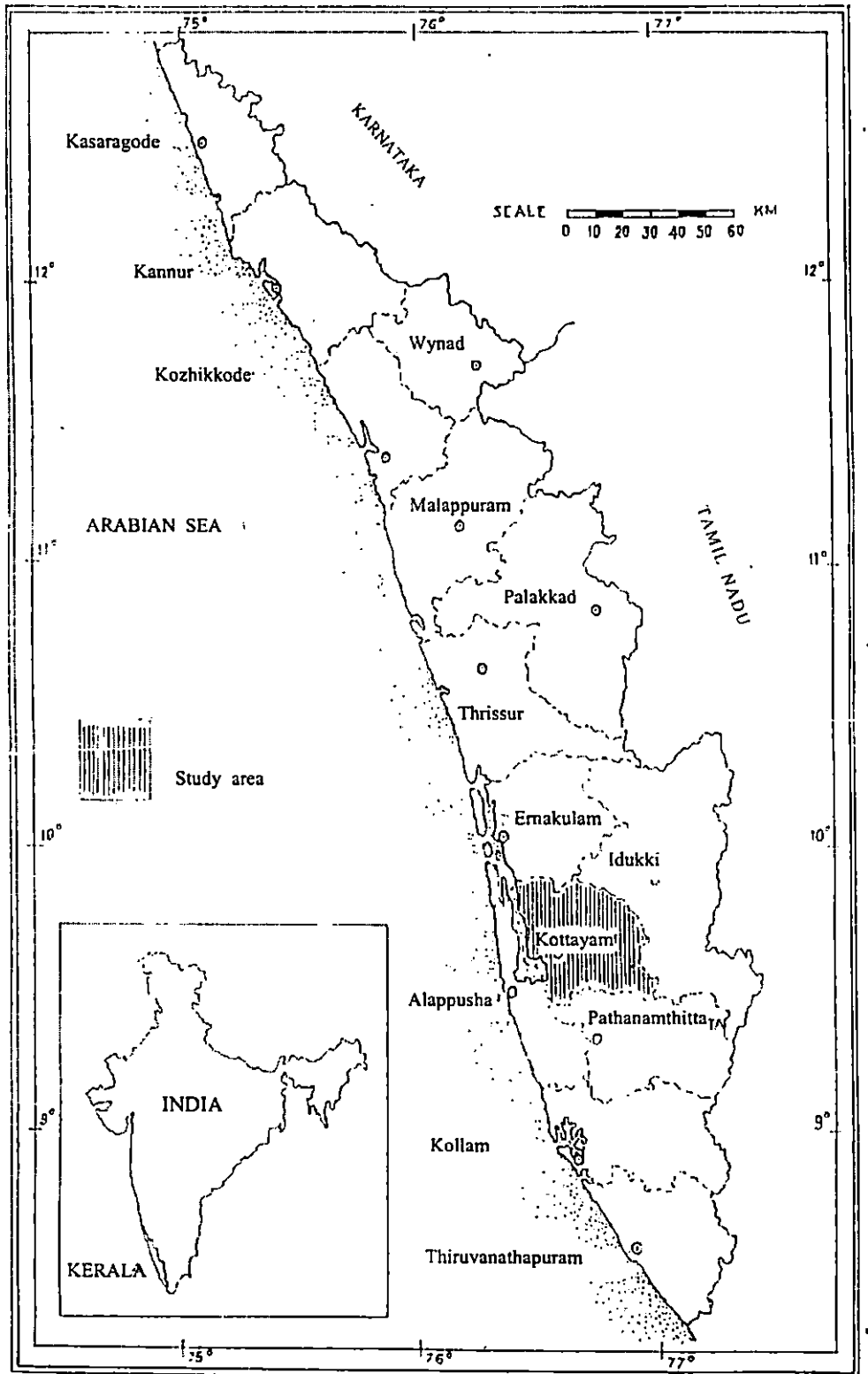


Fig. 3.2. Map of Kerala depicting the study area

### 3.2.1. Topography

The well-marked natural regions, viz., the low-land, mid-land and the high-land into which the state could be topographically divided is identifiable in the district also. The entire landscape is a steady, gradual slope from the east to the low-lands in the west.

### 3.2.2. Climate

The climate is tropical humid with plenty of rainfall throughout the area. The temperature ranges from 33<sup>o</sup> in the hot spells in March-May 23<sup>o</sup>C in cooler months in December.

### 3.2.3. Rainfall

There is considerable inter-spatial variation in rainfall distribution in Kerala. However, Kottayam district received a high rainfall of over 2700 mm during the agricultural year 1996-97 (Table 3.2.1.). The months of January and February were dry periods, with February receiving no rainfall at all.

### 3.2.4. Soil

The soils in the cultivated valley is brown, gravally towards the interior and brown sandy or sandy loam towards the low-lands.

### 3.2.5. Population

According to the 1991 census, the district has a total population of 18.28 lakhs, out of which 9.13 lakhs are males and 9.15 lakhs are females. (Registrar General and Census Commissioner, 1991a). Thus, the males accounted for 50.08 per cent of the total population, while the females accounted for 49.92 per cent of the population, recording

Table 3.2.1 Districtwise Monthly Rainfall in Kerala during 1996-97

Sl No.	District	(mm)												
		July.	Aug	Sept	Oct.	Nov	Dec.	Jan..	Feb.	Mar.	Apr.	May	June	Total
1.	Thiruvananthapuram	214.9	122.4	145.3	337.3	110.9	95.0	2.9	10.1	17.8	63.1	124.6	265.2	1509.50
2.	Kollam	449.2	259.1	273.1	412.2	175.6	74.9	1.3	4.6	75.6	155.4	229.9	344.1	2455.00
3.	Alapuzha	530.3	336.0	243.7	414.5	202.7	108.3	2.1	2.7	67.2	94.7	156.7	463.8	2622.70
4.	Pathanamthitta	470.0	226.4	323.8	240.3	180.6	70.8	0.0	13.4	87.8	80.3	246.2	264.5	2204.10
5.	Kottayam	605.6	293.5	393.1	332.4	176.5	96.1	1.0	0.0	41.9	113.8	206.3	466.4	2726.60
6.	Idukki	1025.1	478.8	616.7	369.5	120.0	142.9	3.9	0.0	59.3	146.1	175.9	393.0	3531.20
7.	Ernakulam	780.1	422.2	568.5	326.6	117.9	171.9	5.8	1.0	48.0	86.3	130.1	550.6	3209.00
8.	Thrissur	650.5	305.4	417.2	213.3	29.5	65.5	0.0	0.0	0.7	6.9	84.0	693.9	2466.90
9.	Pulakkad	515.7	234.0	261.1	247.3	35.2	39.7	0.0	14.1	36.8	30.8	125.1	338.3	1878.10
10.	Malappuram	580.8	303.1	310.9	346.9	41.6	78.5	1.6	0.0	9.5	1.0	67.1	1084.3	2825.30
11.	Kozhikode	940.9	353.8	342.7	304.3	51.6	64.9	3.5	0.0	19.6	29.0	111.8	569.0	2791.10
12.	Wayanad	766.8	352.0	248.6	342.4	19.6	120.3	7.0	7.3	46.3	58.7	156.1	428.5	2553.60
13.	Kannar	965.4	529.7	263.7	296.4	70.5	63.6	0.1	0.0	8.0	9.9	45.6	923.0	3175.90
14.	Kasargode	1024.2	502.2	202.5	305.2	28.2	45.5	0.0	0.0	6.1	4.3	16.3	929.6	3064.60

(Source : Government of Kerala, 1998a; Government of Kerala, 1998b)



least male-female disparity. There are 3.62 lakh households in the district, out of which 2.99 lakhs are rural households, which works out to 82.60 per cent of the total households.

### 3.2.6 Literacy

Kottayam district continues to be the most literate district in India with a literacy rate of 85.08 per cent (Registrar General and Census Commissioner, 1991 b). The male literacy rate is 86.32 per cent while the female literacy works out to 86.33 per cent. Thus, there is no-male-female disparity in literacy rates.

Changanasserry *taluk* forms a distinct high literacy sub-tract (80 per cent and above) in Kerala. Higher literacy rate is significant from the point that literacy greatly expands the range of human potentialities, besides acting as a driving force behind economic and social development.

### 3.2.7 Occupational Pattern of the Population

The occupational pattern of the population is presented in table 3.2.2. It can be seen that the agricultural labourers constituted about 23 per cent of the workforce while cultivators constituted about 16 per

Table 3.2.2. Occupational Pattern of the Agricultural Population in Kottayam

Sl. No.	Particulars	Total	Rural	Urban
1.	Total workforce	537,087 (100.00)	444,786 (82.81)	92,301 (17.19)
2.	Cultivators	84,327 (15.70)	79,762 (94.59)	4,565 (5.41)
3.	Agricultural labourers	125,424 (23.35)	113,776 (90.71)	11,648 (9.29)

(Source : Registrar General and Census Commissioner, 1991b)

cent of the total workforce. More than 80 per cent the total workforce and more than 90 per cent of the cultivators and agricultural labourers were rural in nature.

### 3.2.8. Land Utilisation

With a high rainfall and soil fertility level, every inch of land in district has been brought under appropriate use with little barren or uncultivated land (Table 3.2.3). More than 58 per cent of the total geographic area is put under cultivation. The forest covers only 3.71 per cent of the land area. The cropping intensity of the district worked out to 123.12 per cent which is quite low when compared to the state cropping intensity of 135.42 per cent.

Table 3.2.3. Land Use Pattern of Kottayam District during 1995-96

Sl. No.	Particulars	Area (ha)	As percentage to the total
1.	Total geographic area	219550	100.00
2.	Forest	8141	3.71
3.	Land put to non-agricultural use	22144	10.09
4.	Barren & uncultivable land	2019	0.92
5.	Permanent pasture and grazing land	22	0.01
6.	Cultivable waste	994	0.45
7.	Current fallows	3191	0.45
8.	Land under trees, bushes etc.	128	0.06
9.	Fallow other than current fallows	2117	0.96
10.	Net sown area	180794	82.35
11.	Area sown more than once	41805	19.04
12.	Gross sown area	222599	-
13.	Cropping intensity	-	123.12

(Source : Government of Kerala, 1998b)

### 3.2.9. Land Holding Pattern

The distribution of land holding in the district follows the state pattern with the small and marginal farmers accounting for about 96 per cent of the number of holdings and 68 per cent of the total area (Table 3.2.4), thereby indicating the prevalence of small and marginal farmers in the agricultural production base.

Table 3.2.4. Distribution of Land Holding Pattern in Kottayam District

Sl. No.	Category	Number	Area(ha)
1.	Marginal (below 1ha)	3,06,548 (88.95)	59,835 (42.18)
2.	Small (1-2 ha)	25,276 (7.33)	36,317 (25.60)
3.	Semi-medium (2-4 ha)	10,234 (2.97)	26,604 (18.75)
4.	Medium (4-10 ha)	2218 (0.64)	12,192 (8.59)
5.	Large (10 ha & above)	369 (0.11)	6923 (4.88)
	Total	3,44,646 (100.00)	1,41,871 (100.00)

(Source : State Bank of Travancore, 1998).

### 3.2.10. Cropping Pattern

The cropping pattern of the district is dominated by rubber, occupying nearly 49 per cent of the total cropped area. This is followed by coconut (18.12 per cent), rice (11.18 per cent), tapioca (3.48 per cent) and pepper (3.45 per cent) in that order. Banana occupies 2.36 per cent of the total cropped area. The rest of the crops occupy less than one per cent of the cropped area (Table 3.2.5). Total foodgrain

Table 3.2.5. Cropping Pattern of Kottayam District during 1995-96

Sl. No.	Crops	Area (ha)	As percentage to the gross cropped area
1.	Rice	24878	11.18
2.	Pulses	1580	0.71
3.	Total foodgrains	26458	(11.89)
4.	Sugarcane	233	0.10
5.	Pepper	7687	3.45
6.	Ginger	332	0.16
7.	Turmeric	241	0.11
8.	Cardaman	345	0.14
9.	Arecanut	1035	0.46
10.	Banana	5245	2.36
11.	Pineapple	625	0.28
12.	Papaya	710	0.32
13.	Cashewnut	696	0.31
14.	Tapioca	7737	3.48
15.	Coconut	40333	18.12
16.	Sesamum	54	0.02
17.	Betelvine	20	0.01
18.	Tea	1947	0.87
19.	Coffee	824	0.37
20.	Rubber	109582	49.23
21.	Cocoa	1993	0.90
22.	Others	16502	7.41
22.	Total cropped area	222599	100.00

\* includes Nendran and other Plantains

(Source: Government of Kerala, 1998b)

crops account for hardly 12 per unit of the total cultivated area. Thus, the cropping pattern shows, a predominant tilt in favour of plantation/ horticultural crops as compared to food crops.

### 3.2.11. Irrigation Infrastructure

There are no major irrigation systems in the district. The agricultural operations are dependent mainly on the monsoon. Tank and well irrigation is prevalent to a limited extent. There are no major projects for tapping groundwater resources. As per the groundwater balance data, all the blocks in the district are falling under "white" category, meaning that the levels of exploitation of groundwater is less than 65 per cent of the potential. The present level of exploitation of groundwater potential is around 12.6 per cent only (District Credit Plan 1998).

### 3.2.12. Financial Institutions

The district is having a well-developed banking and credit structure to cater to the requirements of the farm sector. As on March 1997, there were 25 commercial banks operating through 243 branches in the district. There were 142 Primary Agricultural Credit Societies and 2 Primary Co-operative Agriculture and Rural Development Banks with 6 branches in the district. As on 31-3-1997, they had a deposit of Rs.2009.08 crores and advances amounting to Rs. 975.47 crores (District Credit Plan 1998). There have been 12.47 bank branches per lakh population as against the state average of 9.91 branches per lakh population. The per capita bank credit to agriculture is Rs.304, which is higher than the state average of Rs. 276 (CMIE, 1993).

### 3.2.13 Scale of Finance

The scale of finance for the district during the year 1996-97 is presented in Table 3.2.6. It can be seen that banana (nendran variety) is the most capital intensive crop in terms of scale, followed by vegetable ginger

and banana (Plantain). Food crops like paddy, tapioca, pulses had relatively less capital requirement per unit area cultivated.

**Table 3.2.6 Scale of Finance for Crop Loan in Kottayam District during 1996-97**

Crop	Unit	Cash component	Kind component	Total
i) Paddy				
a) Autumn	Ha	5700	1800	7500
b) Winter	Ha	5700	1800	7500
c) Summer	Ha	7500	2500	10,000
ii) Pulses	Ha	1800	700	2500
iii) Tapioca	Ha	7700	1300	9000
iv) Banana				
a) Nendran	Ha	32,500	17,500	50,000
b) Plantain	Ha	12,000	8000	20,000
v) Coconut				
a) Irrigated	Ha	7875	4375	12,250
b) Rainfed	Ha	7000	3500	10,500
vi) Rubber	Ha	8000	3000	11,000
vii) Pepper	1 No.	10	5	15
viii) Vegetables	1 cent (0.01 acre)	90	75	165 (41250/ha)
ix) Cocoa	1 No.	7	5	12
x) Ginger	Ha	23,700	2900	26,600
xi) Coffee	Ha	5000	3500	9000

(Source : District Development Office, NABARD, Kottayam)

### 3.3. Block Profile

Madappally block is located between 9°15' and 10°21' North latitude and 76° 22' and 77°2' East longitudes. It is bound by Pathanamthitta and Alappuzha districts in the south, Vembanad lake and the paddy fields of

Kuttanad in the West, Vazhoor block in the East and Pallom block in the North. It has got an area of 145.04 sq. kms.

Madappally forms one of the 11 Development Blocks of Kottayam district. The block consists 7 village panchayats. The block comprises of low and mid-lands only. 67.93 per cent of the total cropped area in the block is irrigated (State Bank of Travancore, 1998). All the villages are electrified.

Changanasserry railway station is the nearest railway station in the block. There are no regulated markets in the state, and hence no regulated markets are operating in the district also. The important marketing centre of the block is Changanasserry, which is a well developed market centre at the state level also. The block is having a well-developed banking infrastructure with 32 branches of commercial banks, 7 branches of the district cooperative bank and 14 Primary Agricultural Credit Societies.

Madappally block ranks first in terms of achievements against the target set for crop loan disbursement during 1997-98 (Table 3.3.1). Against a target of Rs. 65.83 lakhs, a disbursal of Rs. 103.67 lakhs was made during the year, which works out to 157 per cent achievement. It is indicative of the farm credit absorption capacity of the area under study.

Table 3.3.1. Block-wise Target and Achievement of Crop Loans Disbursed in Kottayam District during 1996-97

(Rs. Lakhs)				
Sl. No.	Name of Block	Target (Rs.)	Achievement (Rs.)	% of achievement
1.	Erattupetta	69.69	81.54	117
2.	Ettumanoor	79.53	76.34	96
3.	Kaduthuruthy	83.99	95.79	114
4.	Kanjirappally	64.39	77.64	121
5.	Lalom	62.41	84.07	135
6.	Madappally	65.83	1.03.67	157
7.	Pallom	87.50	84.88	97
8.	Pampady	63.23	74.77	118
9.	Uzhavoor	88.89	1.13.05	127
10.	Vaikom	22.39	24.64	110
11.	Vazhoor	80.17	51.08	64
	Total	768.031	867.44	113

(Source : State Bank of Travancore, 1998)



## Chapter IV

# METHODOLOGY

This chapter presents the methodological framework used in the study, covering mainly the sampling design, concepts employed, specification of the variables and the analytical tools used.

### 4.1 Sampling Design

Kottayam district was purposively selected for the study because the district had the highest institutional credit disbursement to agriculture during the period from 1985-86 to 1996-97 (Appendix-I).

The district credit plan (DCP) indicated the concentration of crop loan in Madappally block in terms of target, achievement and credit absorption capacity (Table 3.3.1), and hence Madappally block was selected from among the eleven blocks in the district.

A list of villages in the sample block was prepared and a cluster of four villages having the maximum concentration of crop loan disbursement were selected in consultation with the officials of the State Bank of Travancore (the Lead Bank of the District); District Development Manager of the NABARD, and the officials of the Kottayam District Cooperative Bank Ltd. Accordingly, Changanassery, Madappally, Trikkodithanam and Vazhappally villages were selected for detailed study. A list of farmers who were borrowers of crop loan were prepared with the help of PACSs and commercial banks operating in the area. They were stratified into two categories viz., the non-defaulters and the defaulters, and 80 farmers

were selected randomly from each stratum, making a total sample size of 160 farmers.

#### 4.2 Types of Data and Method of Enquiry

The present study is based on primary as well as secondary data. The background information of the study area were collected from the Directorate of Economics & Statistics, Government of Kerala, Trivandrum and the State Planning Board, Trivandrum.

The time series data on agency-wise disbursement of credit to agriculture in accordance with the first objective of the study were collected from the Lead Bank and Priority Sector and Monitoring (LBPSM) cell of Canara Bank, Divisional Office, Trivandrum, who are the convenor of the State Level Bankers' Committee (SLBC).

Since the credit supplied is a flow variable, the actual amounts should be used, and not the outstanding figures which are stock variables (Vogel, 1981; Gadgil, 1986; Desai and Namboodiri, 1991; Kapoor, 1994). Chand (1992) cautions against using outstanding loan amounts because it includes the interest besides the loan advanced, and the accumulated overdues carried over from the previous periods. Hence, the stock variables must be used only when the flow variables are not available. Therefore, all the growth parameters of the concerned institution, like deposits, advances etc. have been based on the actual figures and not on the outstanding figures. Similarly, the delinquency rate is also calculated on the basis of the value of loans disbursed or falling due during a year (i.e. overdues to demand), and not on the basis of overdues as a percentage of total value of loans outstanding (i.e. overdues to outstanding loans). The latter

one is recommended only in the absence of flow data (Vogel, 1981). The Khusro Committee (1989) have also accepted that the standard measurement of overdues is in relation to demand because overdue is to be assessed in terms of that portion of the loan which has actually fallen due during the reference period and not the total loans outstanding which contains other residuals brought forward (Reserve Bank of India, 1989). Hence, the inter-temporal overdue/recovery changes have also been measured in relation to the demand.

Primary data, on which the second, third and fourth objectives are based, were collected from the sample farmers through personal interview, using a pre-tested, structured schedule.

Personal discussions were held with officials of NABARD, Lead Bank, Branch Managers/Field Officers of commercial banks and Secretaries of PACSs to gain insight into operational problems and to understand the lenders' point of view.

#### 4.3 Period of Enquiry

The secondary data pertains to the accounting years from 1985-86 to 1996-97.

The primary data under investigation relates to the agricultural year 1996-97, which was a normal year, with no drought or flood being reported in the study area.

#### 4.4 Concepts used in the Study

To set the discussion in proper perspective, it is necessary to have a working definition of credit and related terms used in the study. Hence, the following terms are used in the meaning as it is outlined below:

#### 4.4.1 Credit

Conventionally, credit is defined as the borrowing capacity (Baker, 1968) or the ability to borrow (Lee *et al.* 1988). So, agricultural credit implied the borrowing of purchasing power for the acquisition of production requisites.

However, the above definitions were criticised by researchers like Pollard and Grewal (1983) on the ground that they viewed credit as a production input rather than as a claim on resources. Hence, they redefined credit as claims on resources. This definition, looked at credit as a resource since it provides the opportunity to use additional inputs and capital items now with an obligation to pay the cost from future earnings. Hence, the present study will be employing the concept of production credit as a claim on productive resources.

#### 4.4.2 Repayment Capacity

Repayment capacity is defined as the surplus of borrower's gross income after meeting the production expenses, consumption expenses, and pre-existing liability, if any (Desai and Desai, 1971; Kahlon and Karam Singh, 1992). The gross income includes the farm as well as non-farm income. Symbolically, it can be written as :

$$RC = Y - (PE + CE + PEL)$$

Where

- RC = Repayment capacity
- Y = Gross Income
- PE = Production Expenses
- CE = Consumption Expenses
- PEL = Pre-existing Liability

#### 4.4.3 Repayment Behaviour

The behaviour is defined as the reaction of an individual or set of individuals to economic stimuli (Patric and Eisgruber, 1968). As human behaviour is goal-oriented, the goals or priority of goals provide impetus to his behaviour.

Rational repayment behaviour expects a borrower to utilize the credit in production process, resulting in increased production/productivity or farm income. The repayment will be made out of the increased income generated. Prompt repayment ensures continued access to bank credit at interest rate lower than the market rates. This provides a strong incentive to the borrowers to repay the loans in time and get it renewed. The main considerations in the renewal of crop loans are

- i) Was the previous loan utilized properly?
- ii) Was the previous loan repaid promptly?

Non-repayment of loan results in default. Generally, default occurs when the borrower does not have enough financial capacity in hand to make the required payment, i.e. non-wilful default. However, default occurs even when the borrowers possesses the financial ability to repay the loan, but does not do so because he is not willing to honour the contract, i.e. wilful default. This happens on account of several reasons. Firstly, the borrower enjoys a temporary income transfer for the period of delinquency, till the bank enforces recovery through legal mechanism. Secondly, he gets opportunities to invest the money in better ventures than farming. Thirdly, there is the fear of credit renewal among some borrowers (i.e. uncertainty about loan renewal). So, low interest rates in the future by

way of renewed loan is not influencing his repayment behaviour. In yet another case, it may be political inducement of loan write-off that is influencing his behaviour of non-repayment because once the loans are legally written off, the temporary income transfer becomes a permanent income transfer.

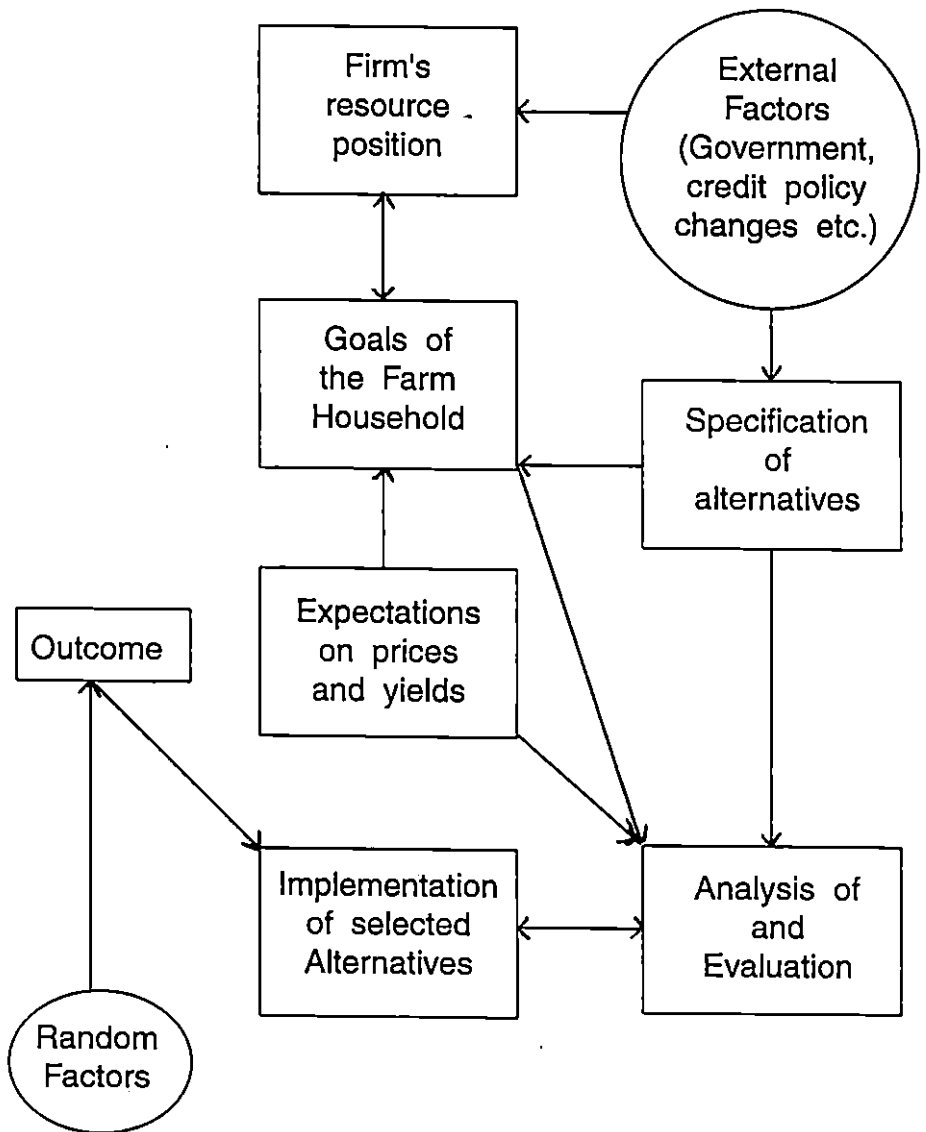
The major elements of a farm behavioural matrix is outlined in Fig. 4.1

#### *4.4.4 Cost of Credit*

The primary cost of credit is the interest expenses. This is an open cost. However, in negotiating and transacting the loan, the farmer will have to incur additional expenses, which are hidden (concealed) costs. For example, the PACS are following a share-linked lending programme. In this case, purchase of shares or additional shares when more loan are required. Similarly, starting the savings bank account and the maintenance of a minimum balance in the case of commercial banks. In both the above cases, the full amount cannot be taken as a cost for one crop loan season. So, the opportunity cost was worked out on the amount as the difference between the average loan interest paid (12 per cent) and the interest rate receivable by putting the amount as savings deposit (5 per cent). So, the opportunity cost was reckoned at 7 per cent/annum.

There are other expenses like cost of photograph, cost of document, legal costs (when equitable mortgage is to be created), travel cost etc. They constitute the credit transaction cost.

The credit acquisition cost, thus consists of the interest expenses plus the credit transaction cost.



**Fig. 4.1. Major elements of farm behavioural matrix**

#### 4.5 Analytical Framework

Tabular analysis was carried out to examine the economic characteristics of the borrower groups, like farm size and family composition, educational status, size group status, farming status, investment pattern on capital assets, cropping pattern, working capital requirements, gross income, gross margin, pattern of credit supply, overdues level etc.

Frequency distribution analysis was carried out to quantify the farmers' perception to different situations. The farmers were asked to rank their responses. If they are ranking 3 statements out of 5 options, the first rank was assigned a score of 5, second rank a score of 4 and the third rank a score of 3. Accordingly, the farmers' perception were prioritised.

The growth in credit institutions, disbursement, recovery etc. were estimated by the compound growth rate (CGR). Trend lines were fitted with the exponential function as given below :

$$Y = Ab^t \quad \dots\dots\dots(1)$$

The estimation was carried out in the log-linear form as :

$$\ln Y = \ln A + t \ln b \quad \dots\dots\dots(2)$$

The compound growth rate was worked out as

$$\text{CGR (\%)} = [\text{Anti ln} (\ln b) - 1] \times 100 \quad \dots\dots\dots(3)$$

For working out the growth rates in real terms, the average consumer price Index (CPI) for agricultural and industrial workers in the state is used as the deflator.



The resources productivity analysis was carried out in paddy, banana, coconut and rubber using the Cobb-Douglas production function. The selection of this algebraic form was influenced by a host of reasons. Firstly, the b coefficient gives the elasticity of production directly. Secondly, the function allows either constant, increasing or decreasing marginal productivity. Thirdly, the function results in the minimum loss of degrees of freedom while estimating the parameters (Heady and Dillon, 1988; Dillon and Anderson, 1990). Again, the Cobb-Douglas production function is the most suitable functional form when the inputs are used in proportional amounts (Doll, 1974). The specification of the function is :

$$Y = \alpha X_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} X_5^{b_5} X_6^{b_6} \dots\dots\dots(4)$$

Where,

Y = Gross income from the crop considered in Rs.

X<sub>1</sub> = Cultivated area under the crop in hectares

X<sub>2</sub> = Seed cost in Rs.

X<sub>3</sub> = Total labour cost in Rs.

X<sub>4</sub> = Animal/machinery hiring charges in Rs.

X<sub>5</sub> = Cost on plant nutrients in Rs.

X<sub>6</sub> = Cost on plant protection chemicals in Rs.

The extensive review of literature on multicollinearity by Doll (1974), Koutsoyiannis (1977) and Gujarati (1995) has conclusively illustrated that the conventional method of testing multicollinearity when  $r_{x_i x_j} (i = j) \geq 0.80$  provides only practical convenience, and not a good test at all. On the otherhand, there can be problems of multicollinearity with lower r values

(say  $> 0.50$ ) when the zero order correlation matrix of the independent variables are worked (Gujarati, 1995).

Moreover, many researchers have cautioned against dropping of variables from a model because it may result in model specification bias (Koutsoyiannis, 1977; Gujarati, 1995). Hence some empirical studies tackled the problem by the linear combination of coefficients having collinearity. However, Doll (1974), and Heady and Dillon (1988) are against the aggregation of inputs on grounds of quality differences in inputs. Another argument is that the Cobb-Douglas production function assumes proportionate input use. But, when proportionate input-mix is used, which are not equal on all farms, exact multicollinearity results (Doll, 1974). Hence, he considered the presence of multicollinearity as a verification of the economic model specified. Koutsoyiannis (1977) also concurred that multicollinearity is not a condition that either existed or did not exist in economic functions, but rather a phenomenon inherent in most relationships due to the nature of economic magnitudes. Gujarati (1995) acknowledged that it is a fact of life that many of our explanatory variables are highly collinear. He argued that the OLS estimators still retained the BLUE properties even if multicollinearity was very high, with the possibility of getting estimates with higher standard errors. On the otherhand, Koutsoyiannis (1977) had a diametrically opposite view that while the presence of multicollinearity *may* impair the accuracy and stability of the parameter estimates, the standard errors need not necessarily be high. Thus, there is no general agreement on the nature and effects of multicollinearity. But, there is consensus of opinion that multicollinearity may be ignored if it is not serious (Klein, 1962; Doll, 1974; Koutsoyiannis, 1977; Sankhayan, 1988, and Gujarati, 1995).

Considering the views as presented above, the seriousness of multicollinearity was tested as suggested by Klein (1962) as :

$$r^2_{xixj} \geq R^2 \quad Y_{x1,x2,\dots,xk} \dots\dots\dots(5)$$

i.e. multicollinearity is serious only if the square of the simple correlation coefficient between two independent variables is greater than the coefficient of multiple determination.

The present study used the above criteria to detect and test the seriousness of multicollinearity and treat it accordingly.

The behavioural model used to examine the factors influencing the repayment/default decision of a farmer was a logit model based on logistic cumulative distribution function. The model can be specified as :

$$Y_i = g(Z_i) \dots\dots\dots(6)$$

$$Z_i = \alpha + \beta_k X_{ki} \dots\dots\dots(7)$$

Where

$Y_i$  = Repayment status of the borrower ( $Y = 1$  for non-default, and  $Y = 0$  for default)

$Z_i$  = An underlying and unobserved response for the  $i^{th}$  farmer. When  $Z$  exceeds threshold  $Z^*$ , the farmer tends to repay; otherwise he defaults

$X_{ki}$  =  $k^{th}$  explanatory variable for the  $i^{th}$  farmer

$i$  = 1,2,3,...,  $N$ , where  $N$  is the number of farmers

$K$  = 1,2,3,...,  $M$ , where  $M$  is the total number of explanatory variables

$\alpha$  = constant

$\beta$  = unknown parameter

The logit model postulates that  $P_i$ , the probability of the  $i^{\text{th}}$  farmer repaying the loan promptly is a function of an index variable  $Z$ ; summarizing a set of the explanatory variables. In fact,  $Z$ , is equal to the logarithm of the odds ratio, i.e., the ratio of probability of a farmer promptly repaying the loan to the probability that he defaults, and it can be estimated as a linear function of explanatory variables ( $X_{ki}$ ). Formally, it can be expressed as :

$$Z_i = \ln \left( \frac{P_i}{1 - P_i} \right) = \alpha + \beta_k X_{ki} \quad \dots\dots\dots(8)$$

Once this equation is estimated,  $P$  can be calculated as

$$P_i = F(Z_i) = F(X_i) = \frac{1}{1 + e^{-Z_i}} \quad \dots\dots\dots(9)$$

$$= \frac{1}{1 + e^{-(\alpha + \beta_k X_{ki})}} \quad \dots\dots\dots(10)$$

Where,  $e$  denotes the base of natural logarithm with a value approximating 2.718.

The parameters of the logit model were estimated directly using the maximum likelihood method. This estimation procedure has a number of desirable statistical properties. All parameters estimators are consistent and also efficient asymptotically (Chow, 1985; Maddala, 1986). The logistic coefficients can be interpreted as the change in log odds ratio associated with one unit change in the independent variable.

There are many methods of testing the goodness of fit of a logit model. However, the Pearson  $\chi^2$  statistic and the likelihood ratio chi-squared statistic ( $G^2$ ) are the most widely used (Demaris, 1992). The

present study employs the  $G^2$  statistic as a goodness-of-fit test. Usually, when we use the chi-squared test, our interest is in rejecting the null hypothesis of independence of variables. The  $G^2$  statistic approaches this perspective from another angle. Suppose that our model for the parsimonious description of the data, can account for the observed frequencies in the sample. This time we are looking for a non-significant  $G^2$  statistic, because that would imply that the expected frequencies considered by the model of independence are reasonably close to those observed in the table (Demaris, 1992). In logistic regression, -2 times the log of the likelihood (-2LL) is analogous to the global F test. -2LL has a chi-square distribution with  $N-M$  degrees of freedom, and hence the null hypothesis that all the betas in the model is zero, against  $H_1$ , which postulates that at least one beta is significantly different from zero (Demaris, 1992). The significance of the explanatory variables was tested using the WALD statistic (Maddala, 1986).

#### 4.6 Specification of Variables

##### Farm Size

As the eligibility of crop loan is determined with respect to the acreage of a crop and its scale of finance, farm holding size is an important determinant of the volume of loan amount. The inability of the farm household to meet the farm family expenses from the farm alone compel members to take off-farm employment.

##### Family Size

Eventhough larger family provides larger labour force, it increases the consumption expenses of the farm household. No farmer would like

to repay the loan by starving his family. Hence the per capita consumption expenses is inversely related to repayment.

### Area under Irrigation

Irrigation imparts stability to production and minimises the variability and uncertainty on account of rainfed farming. Hence, more area under irrigation means more stable farm income. Hence, area under irrigation is positively related to repayment.

### Area under Cash Crops

Cash crops are generally capital-intensive crops - they require more capital in the cultivation increasing the demand for credit. But, at the same time, they are income generating crops also. Hence, more area under cash crops generally mean higher farm revenue, thereby bearing a positive relationship with repayment.

### Educational Status

Education increases the development of the human resources. It increases the ability to collect and analyse the information and more confidence to deal with bank officials. This reduces credit uncertainty and hence it is hypothesized that education is directly related to timely repayment.

### Trainings Attended

The trainings on various aspects of crop production by the State Agricultural University, Department of Agriculture or Financial Agencies helps the farmer for higher skill acquisition and improves his managerial ability. Hence, attending such trainings shall help to organize and run the farm successfully and repay the dues in time.

### Farm Investments

The higher level of investments on farm shows the confidence that the operator has on his own business. For the lender also, it is an indication of the successful running of the business as against lower levels of investment on capital assets exhibiting lack of faith in business.

### Farm Household Income

The financial ability for debt servicing is determined by the surplus of gross income left over production and consumption expenses, to meet the contractual obligation of repayment when the principal plus interest amount are due. Hence, higher farm as well as non-farm income are positively related to better repayment.

Non-farm income provides greater flexibility to the farmer in the event of delay in disbursal, and helps to absorb the occasional reverses in farming. Wealth arising from non-farm income when invested in farm assets is an important source of non-farm equity for part-time farmers.

### Credit Acquisition Cost

Lower credit acquisition costs are an incentive for the small borrowers to maintain good relationship with the financial institutions for continued concessional loans in future. However, if the credit acquisition costs are high, the lower interest rate cannot act as an incentive to prompt repayment because the transaction costs of repaying and negotiating a new loan far outweighs the consideration of lower interest rate. Hence, credit acquisition cost and repayment are inversely related to each other.

#### 4.7 Limitations

Firstly, the issue of credit widening could not be examined in the absence of data on the number of loan accounts at district as well as state level. Secondly, the data was collected by survey method by interviewing the sample farmers. Therefore, the objectivity of the data is limited to the extent the farmer was able to recollect from memory without recall bias as most of the farmers, except a few, did not maintain any farm records. Thirdly, generalizations have to be drawn carefully and selectively to such areas where similar agro-climatic and socio-economic conditions prevail.



## Chapter V

# RESULTS AND DISCUSSION

The rural financial institutions in India have been built over the years through appropriate policy changes. Initially, institutional credit for agriculture in India was viewed as an effective means of protecting the farmers from the exploitation of the moneylenders. Later, credit was viewed as an instrument for enhancing production, and thereby to rural development.

Increased availability of institutional credit has given rise to many related issues such as inadequacy, lack of timeliness, misutilization and mounting overdues. Large scale non-repayment of loans impair the ability of financial institutions to recycle funds. The present chapter addresses these issues. The results have been presented under four sections. Section one examines the growth in the functioning of credit institutions in terms of number, credit disbursement and recovery performance in Kerala. The economic characteristics of the borrowers and the extent of their production credit need are presented in section two. The pattern of credit supply, timeliness and adequacy of credit supply and repayment behaviour of borrowers are analysed under section three. Section four seeks to examine the factors that influence the repayment behaviour of crop loan borrowers.

### 5.1 Growth in Credit Institutions, Disbursement and Recovery Performance in Kerala

The institutional credit structure in Kerala comprises of the co-operatives, commercial banks and the regional rural banks (RRBs). At the grass roots level, the short-term and medium term cooperative credit

is disbursed by the primary agricultural credit societies (PACs), while the long-term cooperative credit is the exclusive domain of the land development banks (LDBs). As the study focusses on the crop loan borrowers, which is essentially of short term in duration, the present section examines the growth in the purveyors of short-term loan, viz., the PACs, Commercial Banks and RRBs during the period from 1985-86 to 1996-97.

#### 5.1.1 Primary Agricultural Credit Societies

The primary agricultural credit societies are the retail outlet of short-term and medium term cooperative credit. There were 1574 PACs in Kerala, with a membership of 62.66 lakhs, a deposit base of Rs. 440.83 crores, and advances for Rs. 514.01 crores in the year 1985-86. It increased to 1591 PACs with 114.59 lakh members, deposits worth Rs. 1685.06 crores and advances for Rs. 1503.84 crores by the year 1996-97. It meant that while the number of PACs grew annually by 0.36 per cent, the membership grew by 4.99 per cent. The annual growth in deposits was 15.20 per cent while the same for advances was 11.98 per cent at current prices (Table 5.1.1). However, in real terms, the deposits and advances grew by 5.87 and 2.91 percentages per annum respectively (Table 5.1.1), indicating the magnitude of inflation that set into the economy during the period under reference.

#### 5.1.2 Commercial Banks

Unlike the cooperatives, the commercial banks were not having any specific service area till 1989. The service Area Approach (SAA) to rural lending which was operative since April 1, 1989 envisaged that each rural and semi-urban branch of commercial banks would be assigned a specific

Table 5.1.1 Growth in the Functioning of Primary Agricultural Credit Societies in Kerala

Year	Number	Membership (In Lakhs)	Deposits (Rs. Crores)	Advances (Rs. Crores)
1985-86	1574	62.66	440.83	514.01
1986-87	1570	68.18	454.74	598.07
1987-88	1574	72.90	559.29	703.73
1988-89	1580	78.11	647.03	751.18
1989-90	1582	83.71	798.33	785.29
1990-91	1579	90.35	953.79	911.11
1991-92	1581	92.05	1177.57	1229.85
1992-93	1580	63.71	1330.25	1236.09
1993-94	1583	100.67	1506.47	1498.44
1994-95	1583	102.85	1891.23	2010.96
1995-96	1589	111.31	1582.88	1469.69
1996-97	1591	114.59	1685.06	1503.84
Compound growth Rate (Per cent per annum)				
Nominal	0.96	4.99	15.20	11.98
Real	-	-	5.87	2.91

area comprising a cluster of 15-20 villages within which they will operate, adopting a planned approach for its economic growth and thus avoiding duplication of efforts and scattered lending over wide areas (Reserve Bank of India, 1990). This was expected to ensure compactness in the area of operation for lending, with a view to making access to credit easier for the clientele. This way, better credit planning with close monitoring of the fund's end-use was to be achieved.

At the time of bank nationalisation in 1969, there were just 601 commercial bank branches in Kerala. It increased to 1780 branches by 1985-86, and further to 2268 branches by 1996-97, registering an annual growth rate of 1.99 per cent (Table 5.1.2). Thus the post-nationalisation era witnessed a proliferation of commercial bank branches in Kerala. Currently, for every 10,000 population, there is a bank branch in Kerala as against one bank branch per 15,000 population at the national level, indicating the density of bank branches in the state.

The deposits mobilised by commercial banks recorded an annual growth of over 17 per cent while the advances grew by 12 per cent at current prices. In real terms, the deposits grew by nearly 8 per cent while the advances increased by 3 per cent. The high growth in deposits were aided by the huge Non-Resident Indian (NRI) remittances. The failure of advances to keep pace with the growth in deposits implied that the deposits were siphoned out to other states and/or being invested in portfolios as the banks cannot keep the funds idle in view of its high cost in the form of higher interest rates.

### 5.1.3 Regional Rural Banks

The regional rural banks were inducted as the third arm of the multi-agency approach to agricultural lending. There are only two RRBs in Kerala, which are the South Malabar Grameen Bank (SMGB) with Malappuram, Kozikkode and parts of Wayand district as its service area; and the North Malabar Grameen Bank (NMGB) with Kannur, Kasargode and rest of the areas of Wayanad district, not catered by the SMGB. Thus, the RRBs operate in only five out of fourteen districts of Kerala.

Table 5.1.2 Growth in the Functioning of Commercial Banks in Kerala

Year	Number of branches	Deposits (Rs. Crores)	Advances (Rs. Crores)
1985-86	1780	4822.70	2908.17
1986-87	1795	4962.31	3023.08
1987-88	1831	4753.94	2991.48
1988-89	1840	5595.55	3552.48
1989-90	1848	6532.34	3938.33
1990-91	1854	7747.89	4442.38
1991-92	1894	9528.63	4789.59
1992-93	1946	11940.68	5585.83
1993-94	2002	14729.47	6178.79
1994-95	2063	17194.52	7482.62
1995-96	2127	19907.91	8609.20
1996-97	2268	22694.24	10042.56
Compound Growth Rate (Per cent per annum)			
Nominal	1.99	17.20	12.37
Real	-	7.71	3.27

There were 262 RRB branches in Kerala during 1985-86, which increased to 269 branches by 1996-97, with an annual growth rate of mere 0.80 per cent. The RRBs in general have a low deposit base due to the poor clientele they serve, belonging to the weaker sections of the society (Singh and Babu, 1996). However, the RRBs in Kerala had a deposit base of Rs. 63.85 crores in 1985-86, which increased to Rs. 334.85 crores in 1996-97 which works out to an annual growth rate of 19.03 per cent in nominal terms, and 9.39 per cent in real terms (Table 5.1.3).

Table 5.1.3 Growth in the Functioning of Regional Rural Banks in Kerala

Year	Number of Branches	Deposits (Rs. Crores)	Advances (Rs. Crores)
1985-86	262	63.85	125.58
1986-87	265	60.21	132.68
1987-88	269	57.38	124.57
1988-89	269	71.20	148.67
1989-90	269	87.74	179.83
1990-91	269	109.78	195.81
1991-92	269	142.30	213.37
1992-93	269	171.56	232.16
1993-94	269	211.59	262.75
1994-95	269	260.70	313.90
1995-96	269	263.39	351.71
1996-97	269	334.85	439.27
Compound Growth Rate (Per cent per annum)			
Nominal	0.15	19.03	12.12
Real	-	9.39	3.04

Incidentally, the growth in deposit for RRBs is higher than that for the commercial banks. But, growth in advances was lagging the robustness in the growth of the deposits. It grew by over 12 per cent, which in real terms works out to 3 per cent per annum. In other words, while the deposits of RRBs grew faster than commercial banks, the latter maintained a marginally higher growth in advances through their wider network of branches.

#### 5.1.4 Growth in Institutional Credit to Agriculture

The total agricultural credit disbursed by institutional agencies in Kerala was Rs. 395.82 crores during 1985-86. It increased to Rs. 1357.19 crores by 1996-97, representing a 3 fold increase. The annual growth rate in institutional credit delivery to the farm sector during the corresponding period was 11.84 per cent at current prices, which when translated into real terms, worked out to merely 2.78 per cent per annum (Table 5.1.4).

The annual growth rate of institutional credit supply among the districts varied considerably. The highest growth of 19.66 per cent per annum was recorded in Kozhikkode district (nearly 10 per cent in real terms), while the lowest being rate of 6.64 per cent per annum was recorded in Kollam district which in real terms worked out to be negative growth. Four districts, viz., Kozhikkode, Malappuram, Kannur, Thiruvananthapuram and Palakkad registered annual growth rates above the state average. This was a clear indication of the imbalances in the growth of institutional credit supply across the districts over time.

##### 5.1.4.1 Agency-wise Supply of Agricultural Credit

Agency-wise, the commercial banks were the dominating source of institutional credit, supplying above 54 per cent of the total institutional credit to agriculture. The co-operatives stood second, by purveying nearly 36 per cent of the total institutional credit to agriculture, leaving the rest (less than 10 per cent) to the RRBs (Table 5.1.5 and Fig. 5.1). A perusal of the table clearly reveals that while the share of the cooperative credit to the farm sector has been on a steady decline in the state, the relative

Table 5.1.4 Trends in Institutional Credit disbursement to Agriculture in Kerala

(Amount in Rs. Crores)

Sl No	District	1985-86	1990-91	1996-97	Mean (1985-86 to 1996-97)	Compound Growth (1985-86 to 1996-97)	
						Nominal	Real
1.	Thiruvananthapuram	45.25	37.84	107.87	55.53	14.84	5.53
2.	Kollam	29.45	32.03	53.33	47.63	6.64	-1.99
3.	Alappuzha	23.12	13.85	69.40	31.91	11.38	2.36
4.	Pathanamthilla	17.63	24.13	53.33	27.46	7.16	-1.52
5.	Kottayam	39.37	62.74	122.38	62.52	10.12	1.20
6.	Idukki	22.80	24.00	75.60	38.19	10.03	1.12
7.	Ernakulam	29.65	45.74	139.42	61.92	15.16	5.83
8.	Thrissur	40.58	41.50	100.78	55.07	6.79	-1.85
9.	Palakkad	29.82	34.86	109.92	48.12	14.84	5.54
10.	Malappuram	38.46	41.60	109.27	53.80	16.13	6.72
11.	Kozhikkode	12.66	42.81	126.29	54.42	19.66	9.97
12.	Wayanad	17.41	29.22	80.20	41.65	10.67	1.71
13.	Kannur	26.81	27.58	120.35	54.22	15.04	5.72
14.	Kasargode	22.81	24.45	64.03	35.69	9.70	0.81
State as a whole		395.82	488.35	1357.19	674.51	11.84	2.78



Table 5.1.5 Agency-wise Share of Institutional Credit to Agriculture in Kerala

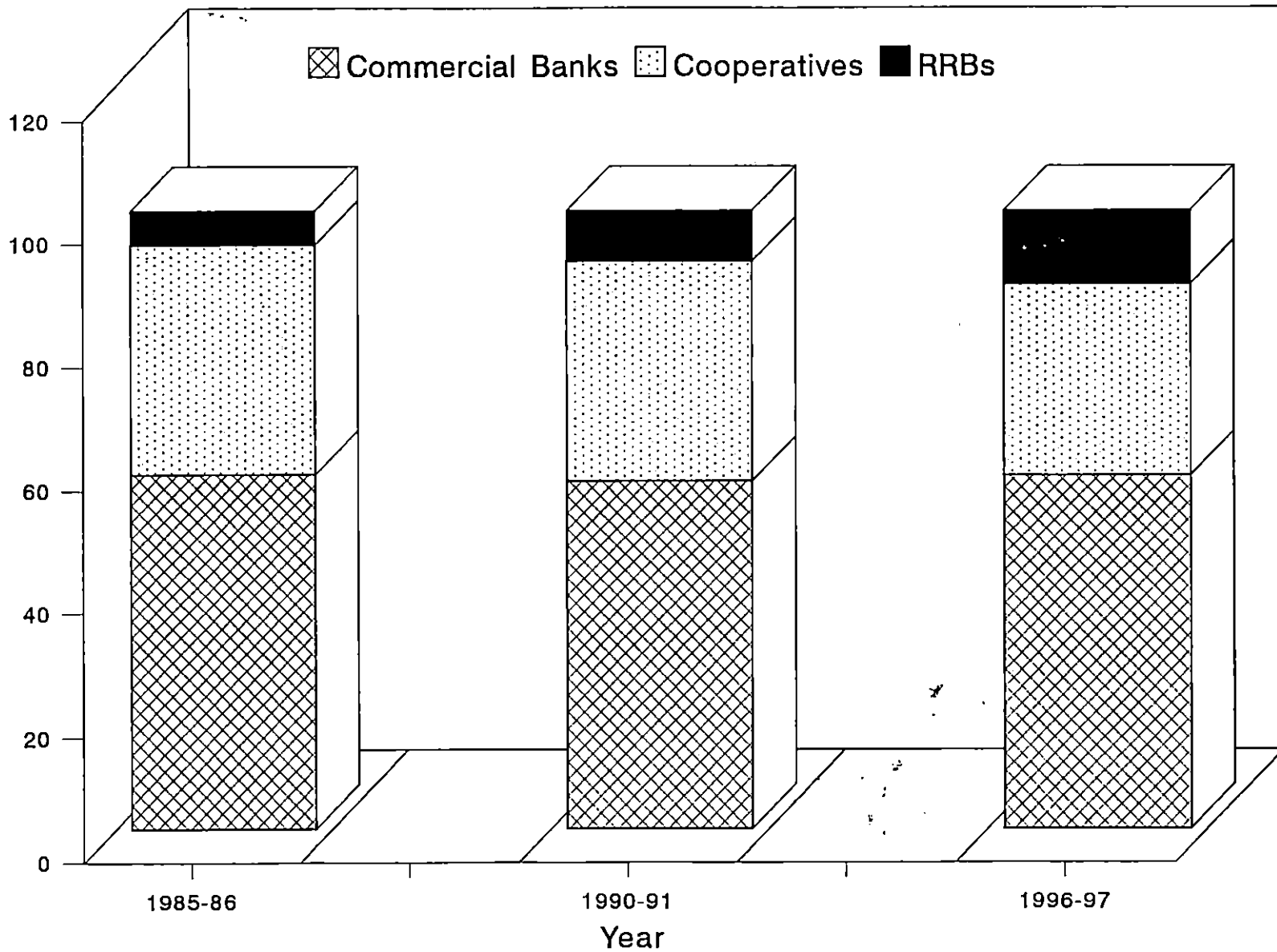
Year	Commercial Banks	Cooperatives	RRBs
1986-87	57.23	37.24	5.53
1987-88	54.04	38.38	7.58
1988-89	53.74	37.45	8.81
1989-90	50.59	39.61	9.80
1990-91	56.11	35.65	8.24
1991-92	46.57	42.63	10.80
1992-93	45.55	42.97	11.49
1993-94	54.37	34.83	10.81
1994-95	58.78	30.22	11.00
1995-96	56.78	34.94	8.28
1996-97	56.92	31.05	12.03
Mean	54.30	35.74	9.96

share of RRBs have shown significant increase from 5.53 per cent in 1989-86 to over 12 per cent in 1996-97. However, the relative share of commercial bank credit has maintained its supermacy over the other farm financial institutions through out the study period.

#### 5.1.4.1a Growth in Regional Rural Bank Credit to Agriculture

Comparison of growth in credit supply by RRBs also showed that there was uneven growth in credit supply spatially as well as temporarily. On an average an annual growth in the credit supply by RRBs was as high as 19 per cent in nominal and 9 per cent in real terms (Table 5.1.6). This is commendable because their area of operation is confined to just 5 districts in the state which meant that the growth in disbursal of farm credit have been achieved by RRBs by more intensive lending in the limited

**Fig. 5.1. Agencywise Share of Institutional Credit to Agriculture in Kerala**



**Table 5.1.6 Growth in Credit Disbursement to Agriculture by Regional Rural Bank in Kerala**

(Amount in Rs. crore)

Sl. No	District	1985-86	1990-91	1996-97	Mean (1985-86 to 1996-97)	CGR (%)	
						Nominal	Real
1.	Malappuram	2.84	14.62	47.54	20.85	23.66	13.63
2.	Kozhikkode	2.48	13.67	45.59	17.84	19.37	9.61
3.	Wayanad	6.23	4.68	24.21	11.10	13.62	4.38
4.	Kannur	1.02	4.11	28.08	11.27	29.98	19.37
5.	Kasargode	7.58	3.16	17.83	8.63	10.26	1.31
State as whole		20.15	40.24	163.25	69.70	18.58	8.94

service area. As is the clientele of the RRBs are targeted sections of the population, viz., the weaker sections, it augurs well for social equity.

#### 5.1.4.1b Growth in Commercial Bank Credit to Agriculture

The next highest growth rate in farm credit supply was experienced by the commercial banks. Their credit supply grew annually by over 13 per cent which in real terms worked out to 4 per cent only (Table 5.1.7). There has been considerable inter-district variations in the growth performance of commercial bank credit supply to agriculture also, with districts like Kollam, Kottayam and Kannur experiencing negative growth in real terms.

#### 5.1.4.1c Growth in Cooperative Credit to Agriculture

The cooperative credit to the agricultural sector had the least growth among the three institutional agencies, which grew by nearly 11 per cent and 2 per cent annually in nominal and real terms (Table 5.1.8). As

Table 5.1.7 Growth in Credit Disbursement to Agriculture by Commercial Bank in Kerala

(Amount in Rs. Crores)

Sl. No	District	1985-86	1990-91	1996-97	Mean (1985-86 to 1996-97)	CGR (%)	
						Nominal	Rural
1.	Thiruvananthapuram	4.75	39.9	76.16	42.87	21.21	11.35
2.	Kollam	28.44	21.13	37.96	32.72	7.14	-1.57
3.	Alappuzha	15.84	14.57	53.13	23.37	15.18	5.81
4.	Pathanamthitta	14.83	17.14	46.36	20.44	10.26	1.30
5.	Kottayam	27.34	21.37	60.78	31.91	8.71	-0.13
6.	Idukki	13.29	12.03	40.18	19.14	13.33	4.12
7.	Ernakulam	3.74	30.12	93.97	37.34	29.07	18.58
8.	Thrissur	31.85	30.59	77.48	38.85	9.51	0.60
9.	Palakkad	12.37	24.99	73.68	32.12	16.69	7.20
10.	Malappuram	5.53	22.59	64.23	27.47	22.61	12.64
11.	Kozhikkode	5.17	23.66	60.26	27.81	21.37	11.50
12.	Wayanad	18.02	16.63	32.27	18.87	4.40	-4.08
13.	Kannur	19.14	10.04	36.69	17.01	8.64	-0.19
14.	Kasargode	8.12	7.02	19.34	10.10	9.19	0.32
State as whole		208.43	291.78	772.49	380.02	13.25	4.05

in the case of commercial bank credit, the cooperative credit to agriculture too showed considerable interdistrict variation in the growth of credit supply with a real growth rate of over 10 per cent (Palakkad and Kannur districts) to negative growth rates (Kollam, Pthanamthitta, Idukki, Ernakulam and Thrissur districts).

Table 5.1.8 Growth in Credit Disbursement to Agriculture by Cooperatives in Kerala

(Amount in Rs. Crores)

Sl No	District	1985-86	1990-91	1996-97	Mean (1985-86 to 1996-97)	Compound Growth (1985-86 to 1996-97)	
						Nominal	Real
1.	Thiruvananthapuram	3.64	7.19	31.71	13.59	12.35	3.20
2.	Kollam	10.81	10.08	15.37	16.56	3.40	-5.00
3.	Alappuzha	3.89	6.38	16.27	9.33	10.47	1.48
4.	Pathanamthitta	6.03	10.93	6.97	7.91	-2.14	-10.11
5.	Kottayam	16.32	35.84	61.60	32.71	13.66	4.43
6.	Idukki	14.36	11.12	35.42	20.45	7.74	-1.01
7.	Ernakulam	23.93	18.56	45.45	27.51	7.22	-1.50
8.	Thrissur	14.42	12.30	23.30	17.54	2.61	-5.72
9.	Palakkad	5.06	5.12	36.24	17.66	19.46	10.11
10.	Malappuram	1.91	8.62	22.52	13.87	18.24	8.63
11.	Kozhikkode	6.18	7.36	20.44	12.57	10.15	1.23
12.	Wayanad	8.01	12.07	23.72	13.88	13.10	3.90
13.	Kannur	10.82	13.40	55.58	28.42	20.12	10.36
14.	Kasargode	10.23	15.13	26.86	18.13	11.35	2.29
State as a whole		135.61	174.1	421.45	250.13	10.83	1.86

The coefficient of correlation between the growth rates of total institutional credit to agriculture in Kerala and that of commercial bank credit worked out to 0.71. It was significant at one per cent level. Similarly, the coefficient of correlation between the growth rates of total institutional credit to agriculture and that of cooperative credit worked out to 0.64. It was also significant at one per cent level. It implied that

the growth in total institutional credit to agriculture in Kerala was influenced by growth in both commercial bank as well as cooperative credit - but the influence was more pronounced in the case of commercial bank credit growth.

#### 5.1.5 Credit Deepening

Credit deepening refers to larger amounts of credit per hectare being disbursed over time and credit widening refers to bringing more farmers into the fold of institutional credit (Gadgil, 1986).

The amount of institutional credit purveyed per hectare of cropped area is presented in Table 5.1.9. It can be noted that on an average the state received credit worth Rs. 2027/ha of cropped area. The highest credit per hectare of cultivated area was received by Kottayam district (Rs.2464/ha), followed by Thiruvananthapuram district (Rs. 2459/ha). Kollam, Pathanamthitta, Ernakulam, Thrissur, Kozhikkode, Wayanad and Kasargode districts received higher credit per hectare than state average, as compared to the districts of Alappuzha, Idukki, Palakkad, Malappuram and Kannur which received less than the state average.

The credit delivered per hectare of cropped area increased from Rs. 1382/ha (Rs. 440/ha in real terms) in 1985-86 to Rs. 3460/ha (Rs. 456/ha in real terms) in 1995-96. During the period under study, the districts of Kottayam, Alappuzha, Idukki, Ernakulam, Palakkad, Kozhikkode, and Wayanad experienced credit deepening in both, nominal as well as real terms while remaining districts experienced credit deepening in nominal terms only.

Table 5.1.9 Total Institutional Credit Disbursement per Unit of Cropped Area in Kerala

Sl No	District	1985-86	1990-91	1996-97	Mean (1985-86 to 1996-97)	Compound Growth (1985-86 to 1996-97)	
						Nominal	Real
1.	Thiruvananthapuram	2076 (661)	1828 (420)	4634 (611)	2459 (488)	16.60	7.48
2.	Kollam	1321 (421)	1436 (330)	2552 (336)	2133 (435)	8.03	-0.42
3.	Alappuzha	1482 (472)	796 (183)	3740 (493)	1757 (349)	9.82	1.23
4.	Pathanamthitta	1588 (506)	1900 (437)	3228 (426)	2089 (438)	4.50	-3.67
5.	Kottayam	1647 (525)	2593 (596)	4475 (590)	2664 (547)	8.11	-0.35
6.	Idukki	1157 (369)	1231 (283)	2857 (376)	1629 (332)	7.72	-0.71
7.	Ernakulam	1200 (382)	1852 (426)	4321 (569)	2284 (442)	15.32	6.29
8.	Thrissur	1853 (590)	1939 (446)	4529 (561)	2371 (492)	5.23	-3.00
9.	Palakkad	938 (299)	1028 (236)	2343 (309)	1251 (249)	12.01	3.25
10.	Malappuram	1361 (521)	1513 (348)	3494 (460)	1861 (372)	13.92	5.01
11.	Kozhikkode	621 (198)	1982 (456)	3203 (422)	2229 (434)	18.52	9.25
12.	Wayanad	1201 (382)	1849 (425)	3029 (399)	2251 (469)	5.75	-2.52
13.	Kannur	1271 (405)	1057 (243)	3498 (461)	1872 (372)	10.52	1.87
14.	Kasargode	1606 (512)	1722 (396)	3531 (465)	2270 (464)	7.50	-0.91
	State as whole	1382 (460)	1597 (367)	3460 (456)	2027 (408)	9.88	1.29

Figures in parentheses indicate the amount at the constant prices

### 5.1.6 Recovery of Loans and Delinquency Rates

The level of overdues is the most important indicator of the financial health of a lending institution (Reserve Bank of India, 1989). Hence, an attempt is also being made to examine the growth pattern of overdues and recovery rates.

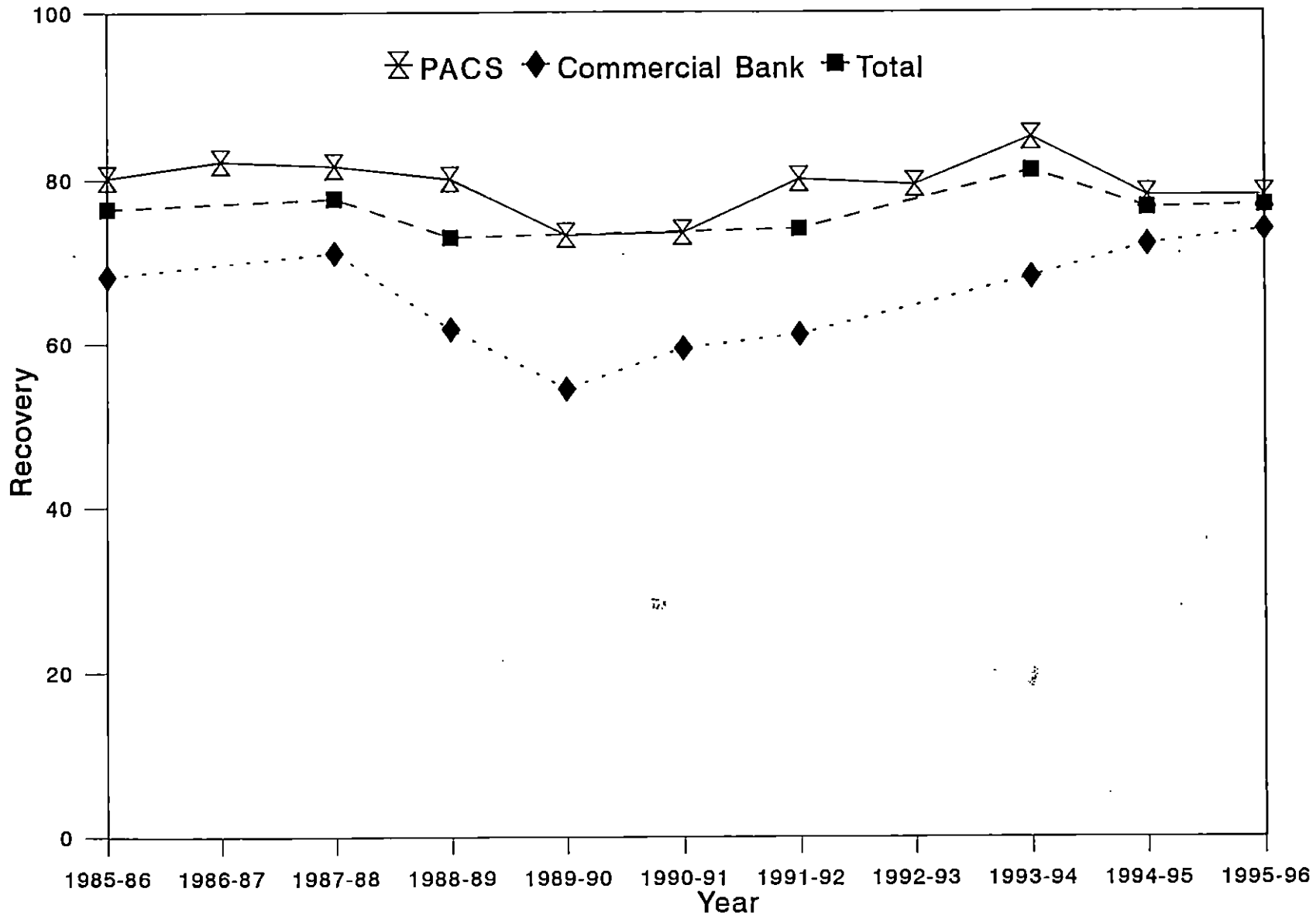
The recovery performance of all the institutional credit agencies in Kerala is presented in Table 5.1.10. The recovery and overdues in absolute term have been growing over the years, but the overdues to demand has been fluctuating from year to year (Fig. 5.2). It was minimum (18.98 per cent) in 1993-94, and highest (26.98 per cent) in 1988-89. On an average, the financial institutions in the state had an overdues of 23 per cent with loan recovery close to 77 per cent of the total disbursement.

Table 5.1.10 Recovery Performance of Agricultural Sector Advances of Institutional Credit Agencies in Kerala

Year	Demand	Recovery	Overdues	(Amount in Rs. Crores)	
				Overdues to demand (%)	Recovery (%)
1985-86	780.60	596.77	183.83	23.55	76.45
1987-88	1018.03	790.76	227.27	22.32	77.68
1988-89	1333.28	973.54	359.74	26.98	73.02
1991-92	1886.28	1396.58	489.79	25.96	74.04
1993-94	2664.49	2158.76	505.73	18.98	81.02
1994-95	1972.00	1509.79	462.21	23.44	76.56
1995-96	2060.92	1584.05	476.87	23.14	76.86
Mean	1673.67	1287.18	386.49	23.09	76.91



**Fig. 5.2. Recovery Performance of Agricultural Sector Advances of Institutional Credit Agencies in Kerala**



Comparison of the the recovery performance of various financial institutions presented a mixed picture. The overdues of the PACSs fluctuated from 15 per cent in 1993-94 to 27 per cent in 1989-90. On an average, the PACSs had a delinquency rate of nearly 21 per cent implying thereby a recovery performance of nearly 79 per cent (Table

Table 5.1.11 Recovery Performance of PACSs in Kerala

Year	Demand	Recovery	Overdues	(Amount in Rs. Crores)	
				Overdues to demand (%)	Recovery (%)
1985-86	528.66	423.88	104.78	19.82	80.18
1986-87	609.33	500.26	109.07	17.90	82.10
1987-88	726.47	592.80	133.67	18.40	81.60
1988-89	821.60	657.69	163.91	19.95	80.05
1989-90	912.09	667.65	244.44	26.80	73.25
1990-91	1097.32	807.08	290.24	26.25	73.55
1991-92	1291.35	1033.08	258.27	20.00	80.00
1992-93	1562.15	1239.41	322.74	20.66	79.34
1993-94	2034.33	1729.18	305.15	15.00	85.00
1994-95	1489.68	1161.95	327.73	22.00	78.00
1995-96	1494.41	1165.64	328.77	22.00	78.00
Mean	1142.49	907.15	235.34	20.60	79.40

5.1.11).

The recovery performance of scheduled commercial banks (including RRBs) too exhibited considerable inter-year fluctuations with slight

Table 5.1.12 Recovery Performance of Agricultural Sector Advances of Commercial Banks (including RRBs) in Kerala

Year	Demand	Recovery	Overdues	(Amount in Rs.Crores)	
				Overdues to demand (%)	Recovery (%)
1985-86	251.94	172.89	79.05	31.38	68.22
1987-88	408.70	290.50	118.20	28.92	71.08
1988-89	511.68	315.85	195.83	38.27	61.73
1989-90	NA	NA	NA	45.60(p)	54.40(p)
1990-91	NA	NA	NA	40.60(p)	59.40(p)
1991-92	595.02	363.50	231.52	38.91	61.09
1992-93	NA	NA	NA	NA	NA
1993-94	630.16	429.58	200.58	31.83	68.17
1994-95	482.32	347.84	134.48	27.88	72.12
1995-96	566.51	418.41	148.81	26.14	73.86
<b>Mean</b>	<b>492.33</b>	<b>334.08</b>	<b>158.25</b>	<b>32.14</b>	<b>67.86</b>

p denotes provisional nature of data

A comparison of overdues of cooperatives and commercial banks revealed that the recovery rate in cooperatives have been higher than that of commercial banks in all the years under study. This could be attributed to the democratic management of the cooperative credit system. The members belonging to the same village, know each other well. They exert peer group pressure on erring members so that the non-erring members do not suffer. Such peer group mechanism is inherently absent in commercial bank lending. With better manpower and more professional management, the average recovery rate of 68 per cent appeared to be

low for commercial banks, and invites the attention for improvement through concerted efforts.

The following conclusions emerge from the analyses presented above. Agency-wise, the commercial banks were the major source of institutional credit to agriculture, supplying more than half of the total credit. They, along with the regional rural banks had an impressive growth in deposit mobilisation and credit delivery through the wide network of their branches. The growth in lending by the cooperatives appeared to be less attractive than that of other financial institutions. Secondly, there were inter-regional and inter-temporal variations in the flow of all forms of institutional credit in Kerala. This resulted in regional imbalances in the supply of institutional credit. Inter-regional differences existed in credit deepening also. There was inter-year fluctuations in the overdues to demand irrespective of the credit agencies. However, the recovery performance of the PACS were relatively better than that of the commercial banks on account of the peer group pressure exerted by the democratic management.

## 5.2 Economic Characteristics of the Borrowers and the Extent of Their Credit Need in Crop Production

An analysis of the economic characteristics of the borrowers will provide the information on the cropping pattern and farm practices prevalent in the area under study. Farm practices depend primarily upon such economic parameters as family size, land holding size, educational status, pattern of land utilization, level of farm investments, irrigation facilities etc. Hence, the analyses of the economic characteristics of the

borrower farmers provide an insight into the physical, organisational and institutional environment within which the borrowers are operating.

### 5.2.1 Farm Size and Family Composition

The average size of holding of the borrower farmers was below 1 ha (0.94 ha). The average holding size was higher for nondefaulters as compared to the defaulters (Table 5.2.1). On an average, nearly 58 per cent of the holding area were irrigated. The average family size was about five, with all the categories exhibiting more or less similar size of family. Sex-wise break up of the family size showed that there was not much pronounced variation in the gender composition of the borrower household with least male-female disparity. This is in perfect concurrence with the trend prevalent in the state as a whole. There was also not much variation in the average age of the head of the family, with an overall average age of 53 years. The borrower farmer had put in, on an average, 23 years of experience in farming and 11 years experience in institutional borrowing. The non-defaulter farmers had relatively higher experience in farming than that of defaulters irrespective of the sources of borrowing. The experience of institutional borrowing by the members of the cooperatives were higher than that of commercial banks. This is understandable as the commercial banks came into the picture of agricultural lending much late than the cooperatives.

Economic theory suggests that leasing of land is conducive to its more rational use especially in labour surplus economies with skewed distribution of land holdings (Raj, 1975). Various types of tenancy existed in Kerala ranging from virtual ownership to tenancy at will, prior to the Kerala Land Reforms Acts, 1963 (as amended in 1969) that came into

**Table 5.2.1 Farm Size and Family Composition of the Borrower Farmers**

Particulars	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
Number of farmers	40	40	80	40	40	80	160
Total operational holding (ha)	39.89	45.74	85.63	32.83	31.84	64.67	150.30
Area leased in (ha)	1.01	1.51	2.52	0.65	0.22	0.87	3.39
Leased in area as % to the cultivated area	2.47	3.16	2.85	1.97	0.71	1.36	2.22
Average size of holding (ha)	1.00	1.14	1.07	0.82	0.80	0.81	0.94
% area under irrigation	65.00	52.26	58.19	57.27	55.68	56.49	57.46
Family size (no.)	5.18	5.18	5.18	5.38	5.38	5.38	5.26
% male members	52.66	50.72	51.69	52.09	49.30	50.70	51.18
Average age of the head of the family (yrs.)	51.05	55.05	53.05	50.63	53.98	52.10	52.58
Experience in farming (yrs)	21.78	26.18	23.98	19.98	23.95	21.70	22.84
Experience in Institutional credit (yrs.)	13.40	8.50	10.95	12.90	10.63	11.65	11.30

force in 1970 (George and Joseph, 1976). However, the said Act brought a sea change to the situation. It abolished landlordism in the state and conferred ownership rights of tenancy lands to the cultivating tenants. Since then, only informal leasing is in vogue in state (Kumar, 1991). Here, the land is leased strictly for a short term out of land owner's fear of any future protective legislations in favour of tenants. This is the reason for the incidence of low rate of tenancy among the farmers under study (Table 5.2.1). The leased in area varied from 0.22 ha to 1.51 ha across the sources of borrowing and was found to be slightly higher for the non-defaulters, both in absolute as well as relative terms to the total cultivated area. The readiness of the non-defaulters to undertake higher risks of farming with their surplus family labour would be the probable reason for this pattern.

### 5.2.2 Educational Status

The educational status of the sample farm families is presented in Table 5.2.2. It can be seen that the literacy level among the sample farmers were very high. None of the borrowers were illiterates. This is understandable when viewed against the fact that Kottayam district is the most literate district in India, and Changanacherry *tehsil* forms a distinct high literate sub-tract in the state.

More than half (nearly 56 per cent) of the borrowers were having the secondary school educational attainment. Nearly 30 per cent were graduates or above, leaving the rest 14 per cent to primary school educated. The level of graduates and above were marginally higher in the case of non-defaulters as compared to the defaulters which showed insignificant difference in the percentage composition of primary and secondary school

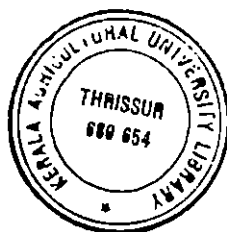


Table 5.2.2 Educational Status of the Borrower Farmers

Particulars	Non-defaulters			Defaulters			Overall mean
	Coopera- tives	Comm- ercial Banks	Average	Coopera- tives	Comm- ercial Banks	Average	
Average family size (no.)	5.18	5.18	5.18	5.38	5.38	5.38	5.26
% illiterates	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% Primary	10.00	17.50	13.75	17.50	12.50	15.00	14.37
% Secondary	62.50	47.50	55.00	52.50	62.50	57.50	56.25
% Graduates and above	27.50	35.00	31.25	30.00	25.00	27.50	29.38
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

educated farmers. In all the four groups of borrowers, the secondary school educated farmers formed the dominant segment.

### 5.2.3 Size Group Status

The examination of farm size status of the borrowers is important as small size of operational holdings and its fragmentation are the major barriers to achieve economy of scale in farm operations and/or adoption of modern means of production. Keeping this in view the small-farm credit has formed the touchstone of our national credit policy since 1969. Table 5.2.3 indicates that the marginal farmers constituted the biggest clientele of both the commercial bank as well as the cooperative credit and formed nearly 67 per cent of the crop loan borrowers. Incidentally, there was not much difference in the constitution of marginal farmers among the defaulter and non-defaulter categories of borrowers. The small farmer category formed the next largest constituent (nearly 24 per cent)



Table 5.2.3 Size Group Status of Borrower Farmers

Particulars	Non-defaulters			Defaulters			Overall mean
	Coopera- tives	Comm- ercial Banks	Average	Coopera- tives	Comm- ercial Banks	Average	
Total number of borrower farmers	40	40	80	40	40	80	160
% marginal farmers (upto 1 ha)	67.50	65.00	66.25	62.50	72.50	67.50	66.88
% small farmers (1-2 ha)	25.00	17.50	21.25	30.00	22.50	26.25	23.75
% others (above 2 ha)	7.50	17.50	12.50	7.50	5.00	6.25	9.37

beneficiaries of the crop loan. The medium/large farmers formed less than 10 per cent of the crop loan borrowers.

The small and marginal farmers together accounted for 91 per cent in the total borrowers of crop loan, indicating thereby that these farmers had greater access to the institutional credit than that of other size groups of farmers. This fact confirmed the views of the National Commission on Agriculture (1976), that the real test of the effectiveness of the agricultural credit policy would lie in the extent to which it induces and helps the institutional financing agencies to develop a credit system which progressively improves accessibility of credit and inputs to small and marginal farmers and helps them to move from subsistence level activities to surplus earning operations.

#### 5.2.4 Farming Status of the Borrowers

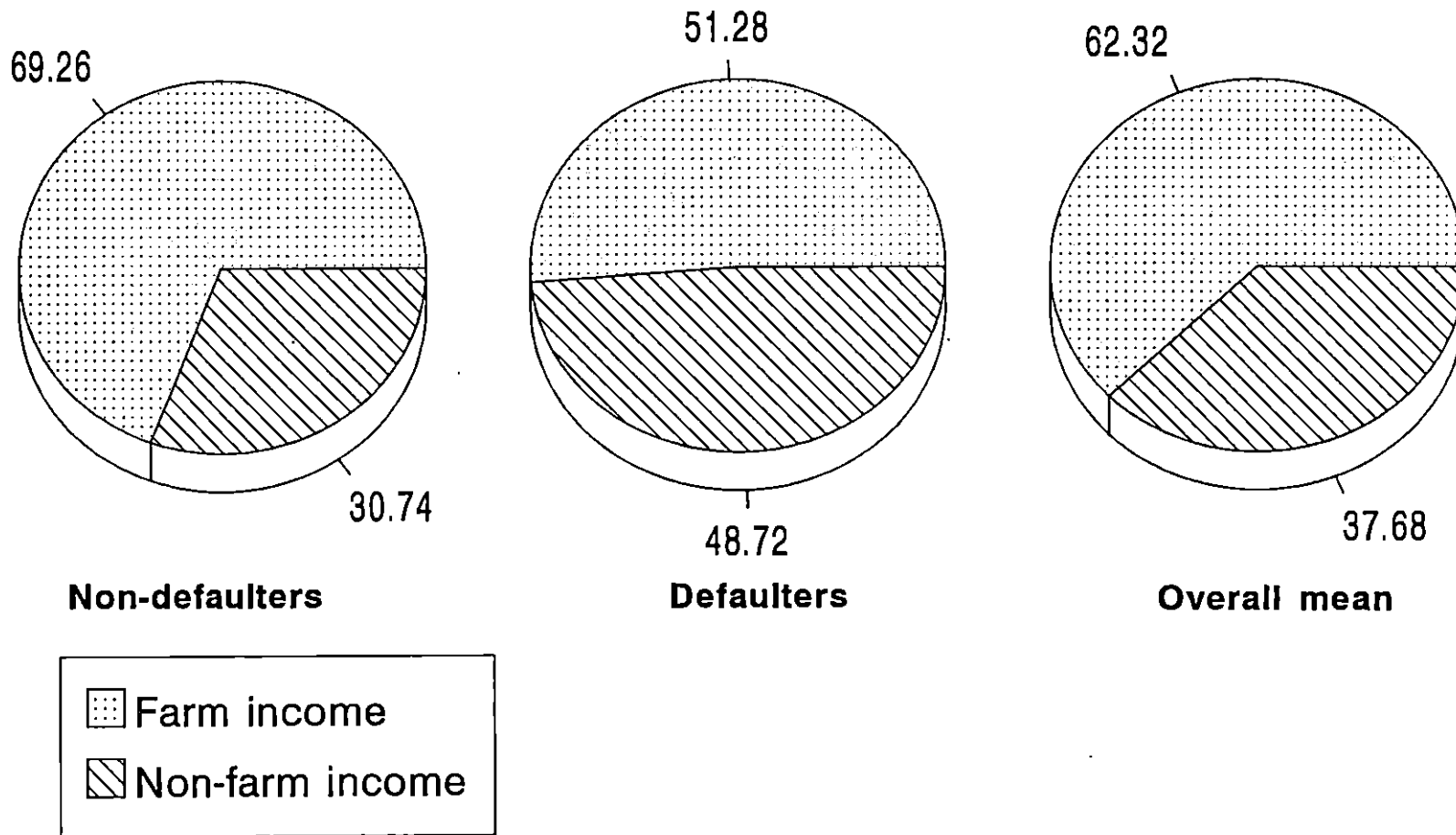
The analysis of the farming status of the borrowers become important when the majority of the producers are small and marginal farmers. As the small size of holdings gradually become economically non-viable units, on-farm income is quite inadequate to meet the subsistence needs of the farm family. This drives more and more farmers to off-farm activities to supplement the farm income. Slowly, the dependency on land of these category of farmers reduces considerably. The increased opportunity cost of the family labour thus made available has led to the prevalence of "part time farmers", who do not cultivate their land as in the case of "owner-cultivators". Their involvement in farming is limited to the supervision of farm operations being carried out through hired labour (Gasson, 1967; Gupta and Tewari, 1985; Haque, 1985; Babu *et al.*, 1993; Haque, 1996; Pingali, 1997). Gasson (1967) feels that since part-time farmers run their holdings in conjunction with other occupation(s), maximising profits is not their goal of farming, as against the "full-time farmers" who rely entirely on his success in farming for his livelihood, and therefore very much guided by the principle of profit maximisation. In the context of Kerala, these farmers are "small farmers" in the conventional sense of land holding size, but not "resource - poor" farmers unlike their counterparts elsewhere in India (Babu *et al.*, 1993).

It can be seen from Table 5.2.4 that more than 50 per cent of the borrowers belonged to the categories of part-time farmers. Their number was more in the case of defaulters (nearly 64 per cent) as against that of non-defaulters (50 per cent), indicating that the defaulters depended relatively less on agriculture. This is corroborated by the composition of

Table 5.2.4 Farming Status of Borrower Farmers

Particulars	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
Total number of borrower farmers	40.00	40.00	80.00	40.00	40.00	80.00	160.00
% part-time farmers	60.00	40.00	50.00	65.00	62.50	63.75	56.88
% full time farmers	40.00	60.00	50.00	35.00	37.50	36.25	43.13
Total income (Rs.)							
Per borrower	75161	101277	88219	60239	50580	55482	71851
Per ha cultivated	73597	84911	79692	73150	65013	69288	75325
% share of farm income	55.16	79.72	69.26	45.04	59.31	51.28	62.32
% share of non-farm income	44.84	20.28	30.74	54.96	40.69	48.72	37.68

the farm and non-farm income. While the farm income constituted 51 per cent of the total income of the defaulters (51.28 per cent), it constituted nearly 70 per cent of the total income of the non-defaulters (69.26 per cent), thereby indicating their reliance more on the success of farming for their total income (Fig. 5.3). Similarly, the income per hectare of cultivated area was considerably higher for the non-defaulters than that of the defaulters, indicating their better skills in farming and more entrepreneurship. Agency-wise, the defaulters and non-defaulters of cooperatives did not show much variation, but the income per hectare of cultivated area of commercial bank non-defaulters were considerably higher than that of their defaulters.



**Fig. 5.3. Relative contribution of farm and non-farm income in the total income of borrower groups**

### 5.2.6 Investment Pattern on Fixed Capital Assets

Even though the crop loans are not an asset-based lending programme, but a production and income-based credit programme, the examination of the investment pattern of the borrowers on fixed capital assets assume importance in view of the fact that asset level of the borrowers are found to increase the credit access (Rajagopalan, 1968). Again, the lenders' considerations on credit-worthiness directly or indirectly have a bearing on the asset level of the borrowers (Gonzalez-Vega, 1977; Berry *et al.*, 1981; Stiglitz and Weiss, 1981; Feder *et al.*, 1988; Hazell, 1992; Zeller, 1994).

The major component of asset structure was the livestock component (Table 5.2.5). It comprised of nearly 43 per cent of the investment on fixed assets by the borrowers. This was followed by the investment on farm buildings (23 per cent) and investment on tools and machinery (19 per cent). Investment on irrigation infrastructure constituted just 15 per cent of the total farm investments. This is understandable as the state receives abundant rainfall through out the year, and the two major crops grown by the borrowers, viz. rubber and coconut are raised mostly as rainfed crops. Rubber is grown exclusively as a rainfed crop while coconut is irrigated in a few cases during the summer months. Paddy is grown in low-land, and hence construction of field channels is the only work connected, which is labour and not capital-intensive in nature. Hence, installation of motor and pumpset in wells is the only capital investment undertaken with irrigation.

Livestock was the major investment item on fixed assets by all borrower groups. This pattern owes its origin to a combination of factors.

Table 5.2.5 Investment Pattern on Fixed Assets by the Borrower Farmers

Particulars	Non-defaulters			Defaulters			Overall mean
	Coopera- tives	Comm- ercial Banks	Average	Coopera- tives	Comm- ercial Banks	Average	
Tool & Machinery	3779 (32.40)	2091 (18.66)	1481 (12.95)	549 (6.88)	587 (9.50)	569 (8.12)	1752 (19.00)
Farm Building	3213 (27.54)	2585 (23.07)	2935 (25.67)	1473 (18.47)	1340 (21.68)	1378 (19.66)	2138 (23.19)
Irrigation infrastructure	1369 (11.74)	1593 (14.22)	2899 (25.35)	1479 (18.54)	1176 (19.02)	1303 (18.59)	1392 (15.09)
Livestock	3304 (28.32)	4935 (44.05)	4119 (36.02)	4475 (56.11)	3078 (49.80)	3759 (53.63)	3939 (42.72)
Total	11665 (100.00)	11204 (100.00)	11434 (100.00)	7976 (100.00)	6181 (100.00)	7009 (100.00)	9221 (100.00)

Figures in parentheses indicate percentage to the respective total

Firstly, it is a managerial mechanism adopted by the small farmers to minimise/avoid risk (Walker and Jodha, 1986; Hazell, 1992). During liquidity crunch, farmers resort to the sale of livestock asset, especially when new credit opportunities are limited. Secondly, the livestock enhances the nutritional status of the household members and help to earn additional income by the sale of surplus milk or eggs after meeting the home demand (Salam *et al.*, 1995). Thirdly, the livestock components interact synergistically with the crop components when the crop residues are used as farm grown feed, and the manure and litter of the livestock are used as renewable sources of organic matter and plant nutrients.

However, the level of farm investment was low by the defaulters as compared to the non-defaulters irrespective of the sources of borrowing.

### 5.2.7 Cropping Pattern

The cropping pattern of the borrowers were dominated by paddy, which covered around 45 per cent of the total cropped area. This was followed by rubber (28 per cent), coconut (14 per cent), banana (7 per cent) in that order (Table 5.2.6). The cropping pattern was highly diversified and included food as well as cash crops. The cash crops had an upper hand, covering nearly half of the cropped area. This indicated the desire on the part of borrowers, who were mostly small and marginal farmers, to optimise their returns per unit of land resource.

Table 5.2.6 Cropping Pattern of the Borrower Farmers

(as % to the total cropped area)

Particulars	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
Paddy	50.13	33.21	41.07	51.78	50.40	51.11	45.34
Tapioca	2.46	0.67	1.50	1.84	1.33	1.59	1.54
Banana	7.17	9.79	8.56	2.78	6.07	4.38	6.78
Rubber	20.17	39.47	30.50	25.24	25.77	25.50	28.35
Coconut	15.41	13.09	14.16	14.05	14.94	13.51	13.87
Pepper	0.51	0.04	0.26	1.01	0.92	0.96	0.56
Others	4.82	3.73	4.24	3.30	2.57	2.95	3.57
Food crops	52.59	33.88	42.57	53.62	51.73	52.70	46.88
Cash crops	43.26	62.39	53.48	43.08	45.70	44.35	49.56
Net sown area	39.66	44.23	83.89	32.76	31.12	63.88	147.77
Gross sown area	40.18	46.33	86.51	33.02	31.27	64.29	150.80
Cropping Intensity	101.31	104.75	103.12	100.79	100.48	100.64	102.05

Food crops include paddy and tapioca

Cash crops include banana, rubber, coconut and pepper.

Others include minor tubers, jack, mango, papaya, tree spices, tree standards for trailing pepper etc.

In general, the non-defaulters as a group had higher share of cash crops (nearly 54 per cent) in their cropping pattern as compared to the defaulters (44 per cent). Agency-wise, the borrowers of commercial banks had relatively higher share of cash crops in their cropping pattern.

Cropping intensity indicates the intensity with which the arable land is being utilized in crop husbandary. It is expressed as a percentage of the gross sown area to the net sown area. In general, the cropping intensity of the borrowers was low (Table 5.2.6). It is due to the domination of the perennial crops, which restricts the area sown more than once in a year. Nearly 43 per cent of the total cultivated area was under perennial crops like rubber, coconut, pepper etc. This meant that the area under seasonal and annual crops were only available for cultivation more than once in a year. In a state where 3 paddy crops can be raised in a year, most of the borrowers were raising one paddy crop in a year probably due to the high hired labour charges and declining profitability of paddy crop, leaving the land fallow during rest of the season. This explains the low cropping intensity of the borrowers. It may be recalled that the cropping intensity for the district was also low (123 per cent only).

#### 5.2.8 Extent of Credit Need in Crop Production

The credit need of the borrowers vis-a-vis the crop loans stem mainly for meeting the current expenditure in connection with the cultivation of crops (Reserve Bank of India, 1972). Hence, the credit need under the crop loan system is being worked out on the basis of acreage and scale of finance for each crop. The scale of finance, in turn is being worked out on the basis of operational expenses to be borne in the cultivation



of the crop concerned that would satisfactorily meet the working capital requirements of the majority of cultivators in the area.

Credit has to play an additional role in the context of the new technology in agriculture, whose major emphasis was on the use of modern inputs in farming like high-yielding variety seeds, balanced use of fertilizers, judicious use of plant protection chemicals etc. Moreover, credit as claims on resources shall result in higher yields through a proper mix of these technological inputs. Hence, before examining the credit need of the borrower farmers through their working capital requirement, it would be essential to examine the intensity of modern input use in the cultivation of major crops, viz., paddy, banana (nendran), coconut and rubber, and for the farm as a whole.

In paddy cultivation, all the three major modern inputs considered, viz., high-yielding variety seed, N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were used more intensively by the non-defaulters group of farmers as compared to the defaulter group of farmers, resulting in higher grain yield (Table 5.2.7). There was no significant difference between the borrowers of cooperatives and commercial banks in the intensity of modern inputs use. This is expected also, as the scale of finance and terms of operations of the crop loans are same for both the institutions. The only difference in the crop loan programme of the cooperatives and the commercial banks is that the cooperatives follow a share-linked lending programme and admits a 5 per cent interest rebate on timely repayment. In general, all the nutrients used were more than the recommended level for short duration paddy in the state (i.e. 70 : 35 : 35 kg/ha) with the seed rate of 100 kg/ha (Kerala Agricultural University, 1989). The P<sub>2</sub>O<sub>5</sub> use by the defaulter

Table 5.2.7 Intensity of Modern Input Use in Paddy Cultivation Among the Borrower Groups

Particulars	(kg/ha)						Overall mean
	Non-defaulters			Defaulters			
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
HYV seed	123.57 (+23.57)	128.74 (+28.74)	125.81 (+25.81)	126.32 (+26.32)	120.88 (+20.88)	123.72 (+23.72)	124.80 (+24.80)
N	77.57 (+10.81)	76.44 (+9.20)	77.08 (+10.11)	74.08 (+5.83)	66.80 (-4.57)	70.59 (+0.84)	73.96 (+5.66)
P <sub>2</sub> O <sub>5</sub>	37.62 (+7.49)	36.51 (+4.31)	37.14 (+6.11)	30.00 (-14.29)	33.27 (-4.94)	31.57 (-9.80)	34.46 (-1.54)
K <sub>2</sub> O	47.54 (+35.83)	43.89 (+25.40)	45.96 (+31.31)	34.91 (-0.26)	42.83 (+22.37)	38.71 (+10.60)	42.48 (21.37)
Nutrient balance ratio	2.06:1 1.26	2.09:1 1.20	2.08:1 1.24	2.47:1 1.16	2.01:1 1.29	2.24:1 1.23	2.15:1 1.23
Grain yield	3400.84	3325.75	3368.34	2703.22	2458.76	2585.97	2992.43

Figures in parentheses indicate the difference in use (%) over the recommended level

group of farmers was nearly 10 per cent below the recommended level. There was not much variation in the nutrient use ratio, though it is slightly imbalanced when compared with the recommended level.

In the case of banana (nendran variety), the intensity of plant nutrients use by both, defaulter and non-defaulters was much higher than that of recommended by the Kerala Agricultural University (Table 5.2.8). However, the application of plant nutrients was more closer to the recommended use in case of the non-defaulter group, as compared to the defaulter group. This has helped to increase the repayment capacity of the non-defaulters by increased yield gains.

Table 5.2.8 Intensity of Plant Nutrient Use in Banana (Nendran) Cultivation Among the Borrower Groups

Particulars	(gms/plant)						Overall mean
	Non-defaulters			Defaulters			
	Coopera- tives	Comm- ercial Banks	Average	Coopera- tives	Comm- ercial Banks	Average	
N	464 (+144.21)	317 (+66.84)	360 (+89.47)	387 (+103.68)	346 (+82.11)	364 (+91.58)	361 (+90.00)
P <sub>2</sub> O <sub>5</sub>	270 (+134.78)	165 (+43.48)	195 (+69.57)	209 (+81.74)	180 (+56.52)	193 (+67.83)	195 (69.57)
K <sub>2</sub> O	647 (+115.67)	395 (+31.67)	468 (+56.00)	329 (+9.67)	335 (+11.67)	333 (+11.00)	446 (+48.67)
Nutrient balance	1.72:1: 2.40	1.92:1: 2.39	1.85:1: 2.40	1.85:1: 1.57	1.92:1: 1.86	1.89:1: 1.73	1.85:1: 2.29
Yield (kg/plant)	8.95	9.49	9.34	6.94	8.14	7.61	9.05

The figures in parentheses indicate the difference in use (%) over the recommended level

In coconut, the intensity of plant nutrient use was less in all the borrower groups against the recommended level of 0.50 : 0.32 : 1.20 kg/palm/annum for good management and a nutrient balance ratio of 1.56 : 1 : 3.75 (Kerala Agricultural University, 1989). This was due to the lower average price of coconut during 1996-97. It was Rs. 4.50/nut as against Rs. 6.00/nut during the previous year. Hence, the farmers in general, tended to leave the coconut palms neglected. Eventhough, all the category of farmers were using a less balanced combination of nutrients than the recommended balanced nutrient use of 1.56 : 1 : 3.75, non-defaulters as a group had higher levels of nutrients use than the defaulters group, resulting in higher yields (Table 5.2.9).

In rubber, the farmers in general had an imbalanced use of nutrients with respect to potassium which was used less than the recommended

Table 5.2.9 Intensity of Plant Nutrient Use in Coconut Cultivation Among the Borrower Groups (kg/palm)

Particulars	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
N	0.52 (+4.00)	0.33 (-34.00)	0.43 (-14.00)	0.28 (-44.00)	0.22 (-56.00)	0.25 (-50.00)	0.35 (-30.00)
P <sub>2</sub> O <sub>5</sub>	0.31 (-3.13)	0.25 (-21.88)	0.28 (-12.50)	0.19 (-40.63)	0.18 (-43.75)	0.19 (-40.63)	0.24 (-25.00)
K <sub>2</sub> O	0.91 (-24.17)	0.70 (-41.67)	0.87 (-32.50)	0.54 (-55.00)	0.40 (-60.67)	0.47 (-60.83)	0.65 (-45.83)
Nutrient balance	1.68:1: 2.94	1.32:1: 2.80	1.54:1: 2.89	1.47:1: 2.84	1.22:1: 2.22	1.32:1: 2.47	1.46:1: 2.71
Yield (Nuts/palm/year)	24.75	24.47	24.61	17.79	14.44	16.12	20.82

Figures in parentheses indicate the difference in use (%) over the recommended level

level of 90 : 90 : 90 gm/tree/annum and a nutrient balance ratio of 1 : 1 : 1 (Kerala Agricultural University, 1989). It is interesting to note that while the intensity of the use of nitrogen and phosphorus were more in the case of defaulters as compared to the non-defaulters, the borrowers of cooperatives had a higher use of plant nutrients irrespective of the default group (Table 5.2.10). It points to two facts. Firstly, crop management approach varied with respect to crops cultivated. Secondly, the distribution of kind components like fertilizers ensured their higher use on farm by farmers. In the case of commercial banks, since they were having no distribution outlets, the kind component was reimbursed to the farmers as and when they produced cash receipts/commercial invoices from the dealer. This has sufficient room for adjustments between the dealer and the farmer, especially when the latter is in acute liquidity crunch. The farmer can take invoice for an amount but may take delivery of an amount

Table 5.2.10 Intensity of Plant Nutrient Use in Rubber Cultivation Among the Borrower Groups

Particulars	(gms/tree)						Overall mean
	Non-defaulters			Defaulters			
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
N	119 (+33.22)	85 (-5.56)	96 (+6.67)	93 (+3.33)	128 (+42.22)	110 (+22.22)	101 (+12.22)
P <sub>2</sub> O <sub>5</sub>	116 (+28.89)	85 (-5.56)	94 (+4.44)	91 (+1.01)	123 (+36.67)	107 (+18.89)	99 (+10.00)
K <sub>2</sub> O	50 (-44.44)	36 (-60.00)	40 (-55.56)	38 (-57.78)	90 (0.00)	64 (-28.89)	49 (-45.56)
Nutrient balance ratio	1.03:1: 0.43	1:1: 0.42	1.02:1: 0.43	1.02:1: 0.42	1.04:1: 0.73	1.03:1: 0.60	1.02:1: 0.49
Yield (kg/tree/year)	3.80	4.25	4.11	2.75	3.17	2.96	3.69

The figures in the parentheses indicate the difference in use (%) over the recommended level

of his own choice. This explains the lower level nutrient use by the commercial bank borrowers, who must have discovered over the years the level of nutrient use to assure a targeted yield by trial and error.

When the farm as a whole is considered, the farmers of the non-defaulter group were found to have more intensive nutrient use pattern as compared to the farmers of the defaulter group (Table 5.2.11). This is because of the aggregate effect of the more pronounced nutrient use disparity that existed between these two category of farmers in paddy and coconut. The nutrient balance ratio was, in general, 1.63 : 1 : 1.55 as against the general use level of 2.08 : 1 : 1.44 for the state in general.

Table 5.2.11 Intensity of Plant Nutrient Use for the Farm as a Whole Among the Borrower Groups

Particulars	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
N	112.13	127.36	120.29	71.56	87.18	79.16	102.75
P <sub>2</sub> O <sub>5</sub>	66.58	81.98	74.82	39.04	55.16	46.88	62.91
K <sub>2</sub> O	120.41	120.01	120.20	54.76	80.16	67.11	97.57
Nutrient balance	1.68:1: 1.81	1.55:1: 1.46	1.61:1: 1.61	1.83:1: 1.40	1.58:1: 1.45	1.69:1: 1.43	1.63:1: 1.55

The working capital requirement of paddy cultivation did not vary considerably across the borrowers groups (Table 5.2.12). Human labour constituted a major share, accounting for nearly 63 per cent of the operational expenses. It indicated the labour intensive nature of paddy cultivation. Modern inputs like improved seed, plant nutrient, plant protection chemicals, herbicides etc. accounted just for 28 per cent of the paid out cost. On an average, it required Rs. 11,748 for cultivating one hectare of paddy while the scale of finance was just Rs. 10,000/ha. Reckoning 100 per cent working capital requirement as the credit need for the small and marginal farmers, and 85 per cent of the working capital requirement as the credit need of the other farmers (leaving a margin money requirement of 15 per cent), it showed that the scale of finance was adequate for the larger category of farmers, while it fell short of the credit need of small and marginal farmers by 14.88 per cent.

Table 5.2.12 Working Capital Requirement of Paddy Cultivation

Particulars	(Rs/Ha)						Overall mean
	Non-defaulters			Defaulters			
	Coopera- tives	Comm- ercial Banks	Average	Coopera- tives	Comm- ercial Banks	Average	
(i) Seed	888.14 (7.57)	923.08 (7.84)	903.26 (7.69)	942.28 (7.82)	872.97 (7.64)	909.04 (7.74)	906.04 (7.71)
(ii) Human labour	7263.42 (61.90)	7268.14 (61.79)	7265.47 (61.85)	7853.33 (65.17)	7158.95 (62.69)	7520.30 (64.01)	7387.91 (62.89)
(a) Family labour	25.81 (0.22)	0.00 (0.00)	14.64 (0.12)	141.81 (1.18)	190.23 (1.67)	165.03 (1.40)	86.90 (0.74)
(b) Hired labour	7237.62 (61.68)	7268.14 (61.79)	7250.83 (61.73)	7711.52 (63.99)	6968.72 (61.02)	7355.27 (62.61)	7301.01 (62.15)
(iii) Machinery hiring	1107.20 (9.44)	1118.34 (9.51)	1112.00 (9.47)	1153.74 (9.57)	1042.70 (9.13)	1100.49 (9.31)	1106.48 (9.42)
(iv) Animal hiring	49.63 (0.42)	0.00 (0.00)	28.15 (0.24)	0.00 (0.00)	17.45 (0.15)	8.37 (0.07)	18.64 (0.16)
(v) Plant nutrients	1838.10 (15.66)	1673.43 (14.22)	1766.82 (15.04)	1613.09 (13.39)	1515.67 (13.27)	1565.46 (13.32)	1670.07 (14.21)
(a) N	940.03 (8.01)	856.33 (7.28)	903.80 (7.69)	859.30 (7.13)	751.43 (6.57)	807.57 (6.87)	857.56 (7.30)
(b) P <sub>2</sub> O <sub>5</sub>	595.99 (5.08)	539.14 (4.58)	571.38 (4.86)	521.39 (4.33)	492.98 (4.32)	507.77 (4.32)	540.82 (4.60)
(c) K <sub>2</sub> O	302.08 (2.57)	277.96 (2.36)	291.64 (2.48)	232.40 (1.93)	271.26 (2.38)	250.12 (2.13)	271.69 (2.31)
(vi) Plant protection	441.79 (3.76)	639.47 (5.44)	527.36 (4.49)	377.08 (3.13)	741.59 (6.49)	551.90 (4.70)	539.15 (4.59)
(vii) Herbicides	53.87 (0.46)	13.65 (0.12)	36.46 (0.31)	15.06 (0.12)	67.10 (0.04)	40.02 (0.34)	38.17 (0.33)
(viii) Soil amendments	93.05 (0.79)	126.79 (1.08)	107.66 (0.92)	96.49 (0.80)	4.76 (0.04)	52.50 (0.45)	81.15 (0.69)
Operational expenses	11735.21 (100.00)	11762.89 (100.00)	11747.18 (100.00)	12051.08 (100.00)	11421.19 (100.00)	11748.08 (100.00)	11747.61 (100.00)

Figures in parentheses indicate percentage to the respective total

However, the working capital requirement of banana (nendran variety) varied widely across the borrowers groups. It was higher for the non-defaulter group as against the defaulter group of farmers (Table 5.2.13). The non-defaulter borrowers of the commercial banks had the highest working capital requirement being Rs. 53830/ha while the same of the commercial banks had the least working capital requirement of Rs. 43356/ha. These differences were mainly accounted by the differences in the plant nutrient expenditure among these two groups of farmers. The banana cultivation too was labour intensive, accounting for nearly half of the total operational expenses. The estimation of the credit need at 100 per cent and 85 per cent of the working capital requirement of the small and marginal; and other category of farmers respectively, revealed that the scale of finance of Rs. 50,000/ha was adequate for the large sized farms while it was inadequate for the small and marginal farmers by 7.11 per cent.

Similar to paddy and banana cultivation, the working capital requirement of maintaining bearing coconut palms also differed among the various groups of borrower farmers (Table 5.2.14). The working capital needs of all borrower groups varied widely and this variation was mainly due to differences in human labour and plant nutrient use. The human labour accounted for nearly 70 per cent of the operational expenses indicating thereby the labour intensive nature of coconut cultivation in the study area. The scale of finance at Rs. 10,500/ha showed its adequacy for all the categories of farmers.

There existed differences in the working capital requirement of rubber among various borrower groups (Table 5.2.15). The non-defaulter



Table 5.2.13 Working Capital Requirement of Banana Cultivation

Particulars	(Rs/Ha)						Overall mean
	Non-defaulters			Defaulters			
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
(i) Seed	3954.31 (7.49)	5632.78 (10.46)	5027.36 (9.40)	4577.50 (10.07)	4444.33 (10.23)	4479.34 (10.15)	4922.82 (9.92)
(ii) Human labour	24303.90 (46.05)	25440.28 (47.26)	25030.35 (46.83)	22400.00 (49.26)	21450.41 (49.38)	21755.01 (49.33)	24391.87 (49.17)
(a) Family labour	68.97 (0.13)	2354.09 (4.37)	1529.85 (2.86)	3937.50 (8.66)	4908.91 (11.30)	4453.13 (10.09)	2063.85 (4.15)
(b) Hired labour	24234.83 (45.92)	23086.19 (42.89)	23500.50 (43.97)	18462.50 (40.60)	16541.50 (38.08)	17301.88 (39.24)	22328.02 (45.02)
(iii) Plant nutrients	17958.64 (34.03)	14049.81 (26.10)	15459.70 (28.93)	12366.88 (27.20)	11404.80 (26.44)	11768.87 (26.79)	14759.38 (25.63)
(a) N	6997.36 (13.26)	45605.74 (10.41)	6107.69 (11.43)	5582.44 (12.28)	4834.41 (11.13)	5139.13 (11.66)	5920.83 (7.79)
(b) P <sub>2</sub> O <sub>5</sub>	5569.12 (10.55)	3811.79 (7.08)	4445.65 (8.32)	3731.31 (8.21)	3319.38 (7.83)	3483.66 (8.00)	4262.49 (8.61)
(c) K <sub>2</sub> O	5392.16 (10.22)	4632.28 (8.61)	4906.36 (9.18)	3053.13 (6.71)	3251.01 (7.48)	3146.08 (7.13)	4576.06 (9.23)
(iv) Plant protection chemicals	3153.45 (5.97)	2174.81 (4.04)	2527.36 (4.73)	4050.00 (8.91)	2930.16 (6.75)	3409.46 (7.74)	2685.39 (5.41)
(v) Miscellaneous expenses	3411.38 (6.46)	6532.73 (12.14)	5406.87 (10.11)	2078.75 (4.56)	3126.52 (7.20)	2646.56 (5.99)	4892.35 (9.87)
Operational expenses	52781.58 (100.00)	53830.41 (100.00)	53451.64 (100.00)	45473.13 (100.00)	43356.22 (100.00)	44059.24 (100.00)	51651.81 (100.00)

Figures in parentheses indicate percentage to the respective total

Table 5.2.14 Working Capital Requirement of Coconut Maintenance

Particulars	(Rs/Ha)						Overall mean
	Non-defaulters			Defaulters			
	Coopera- tives	Comm- ercial Banks	Average	Coopera- tives	Comm- ercial Banks	Average	
(i) Human Labour	6602.57 (62.33)	7032.38 (70.99)	6806.66 (66.48)	5704.92 (72.59)	4947.52 (73.31)	5323.60 (72.92)	6145.41 (68.84)
(a) Family labour	330.04 (3.12)	909.69 (9.18)	612.50 (5.98)	513.32 (6.53)	514.44 (7.62)	511.05 (7.00)	568.44 (6.37)
(b) Hired labour	6272.52 (59.21)	6122.69 (61.81)	6194.16 (60.50)	5191.60 (66.06)	4433.08 (65.69)	4812.55 (65.92)	5576.97 (62.47)
(ii) Machinery hiring	149.67 (1.41)	0.00 (.00)	74.18 (0.72)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	41.05 (0.46)
(iii) Plant nutrients	3164.55 (29.86)	2314.15 (23.36)	2739.45 (26.76)	1929.36 (24.55)	1517.48 (22.49)	1723.54 (23.60)	2285.62 (25.60)
(a) N	1214.20 (11.46)	748.95 (7.56)	981.23 (9.58)	685.91 (8.73)	513.39 (7.61)	599.70 (8.21)	810.79 (9.08)
(b) P <sub>2</sub> O <sub>5</sub>	867.12 (8.18)	731.19 (7.38)	798.18 (7.80)	571.66 (7.27)	473.86 (7.02)	522.79 (7.16)	675.16 (7.56)
(c) K <sub>2</sub> O	1083.23 (10.22)	834.02 (8.42)	960.04 (9.38)	671.79 (8.55)	530.23 (7.86)	601.05 (8.23)	799.67 (8.96)
(iv) Plant protection chemicals	677.74 (6.40)	559.07 (6.65)	618.43 (6.04)	224.35 (2.86)	283.43 (4.20)	253.88 (3.48)	455.58 (5.10)
Operational expenses	10594.52 (100.00)	9905.60 (100.00)	10238.72 (100.00)	7858.63 (100.00)	6748.43 (100.00)	7301.02 (100.00)	8927.66 (100.00)

Figures in parentheses indicate percentage to the respective total

Table 5.2.15 Working Capital Requirement of Rubber Maintenance

Particulars	(Rs/Ha)						Overall mean
	Non-defaulters			Defaulters			
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
(i) Human labour	12939.87 (81.37)	13895.20 (86.23)	13895.20 (85.06)	11223.66 (81.60)	10585.55 (79.23)	10893.29 (80.41)	12650.26 (83.42)
(a) Family labour	0.00 (0.00)	39.06 (0.24)	27.43 (0.17)	239.48 (1.74)	343.48 (2.57)	291.92 (2.15)	120.95 (0.80)
(b) Hired labour	12939.87 (81.37)	13856.14 (85.99)	13867.77 (84.85)	10984.18 (79.86)	10242.07 (76.66)	10601.37 (78.26)	12529.31 (82.62)
(ii) Plant nutrients	2797.96 (17.60)	2062.89 (12.80)	2281.80 (13.97)	2413.86 (17.55)	2716.10 (20.33)	2565.07 (18.94)	2382.04 (15.70)
(a) N	1125.89 (7.08)	825.94 (5.13)	915.27 (5.60)	968.33 (7.04)	1092.45 (8.18)	1030.44 (7.61)	956.02 (6.30)
(b) P <sub>2</sub> O <sub>5</sub>	1107.80 (6.97)	823.79 (5.11)	908.37 (5.56)	960.35 (6.98)	1058.95 (7.93)	1009.56 (7.45)	944.18 (6.23)
(c) K <sub>2</sub> O	564.26 (3.55)	413.16 (2.56)	458.16 (2.81)	485.18 (3.53)	564.70 (4.22)	525.07 (3.88)	481.84 (3.17)
(iii) Plant protection chemicals	164.08 (1.03)	155.69 (0.97)	158.19 (0.97)	117.56 (0.85)	59.49 (0.44)	88.11 (0.65)	133.42 (0.88)
<b>Operational expenses</b>	<b>15901.91 (100.00)</b>	<b>16113.78 (100.00)</b>	<b>16335.19 (100.00)</b>	<b>13755.08 (100.00)</b>	<b>13361.14 (100.00)</b>	<b>13546.47 (100.00)</b>	<b>15165.72 (100.00)</b>

Figures in parentheses indicate percentage to the respective total

borrowers of the commercial banks had the highest capital need on account of more intensive use of hired human labour. Their family labour participation was nil and therefore had to hire human labour for all farm operations. Contrary to this, the defaulter borrowers of the commercial banks had the least capital need as they employed the human labour less intensively. The extent of their family labour participation was highest among all the groups. The labour input accounted for nearly 84 per cent of the operational expenses, thereby indicating the labour-intensive nature of cultivation. The scale of finance for Rs. 11,000/- was inadequate for all group of farmers and all categories of borrowers. It fell short of the working capital requirements by 27.47 per cent in general.

The wide variation in the capital requirement of different crops influenced the variation in the working capital requirement of the farm as a whole (Table 5.2.16). It exhibited a trend of higher working capital need for non-defaulter farmers as against the defaulters farmers. These differences were mainly accounted by the differences in the intensive use of labour, plant nutrients, plant protection chemical, and farm machinery inputs. Human labour formed the major input cost, accounting for over 64 per cent of the operational expenses in all the cases. This was followed by the expenses in plant nutrients (19 per cent), and expenses on seed material (5 per cent).

The gross margin (syn. gross profit) defined as the surplus of gross income over the operational expenses (Johnson, 1990) was highest from banana (nendran variety). It fetched the highest gross margin of 1,18,048/ha, followed by rubber with a gross margin of Rs. 65225/ha. Both nendran variety of banana and rubber are high-value cash crops, the former

Table 5.2.16 Working Capital Requirement of the Farm as a whole

Particulars	(Rs/Ha)						Overall mean
	Non-defaulters			Defaulters			
	Coopera- tives	Comm- ercial Banks	Average	Coopera- tives	Comm- ercial Banks	Average	
(i) Seed	120.41 (0.80)	990.71 (5.22)	920.22 (5.27)	599.24 (4.71)	739.69 (5.51)	667.55 (5.10)	812.50 (5.21)
(ii) Human labour	9639.94 (64.13)	12514.51 (65.98)	11179.40 (63.99)	8565.81 (67.31)	8644.17 (64.37)	8603.92 (65.85)	10081.41 (64.65)
(a) Family labour	260.58 (1.73)	637.28 (3.36)	462.32 (2.65)	509.54 (4.00)	729.65 (5.43)	616.60 (4.72)	528.09 (3.39)
(b) Hired labour	9379.36 (62.40)	11877.23 (62.62)	10717.08 (61.34)	8056.27 (63.31)	7914.52 (58.94)	7987.32 (61.13)	9553.32 (61.26)
(iii) Machinery hiring	596.94 (3.97)	371.25 (1.96)	476.07 (2.72)	549.79 (4.32)	525.52 (3.91)	537.98 (4.12)	502.47 (3.22)
(iv) Animal hiring	24.89 (0.17)	0.00 (0.00)	11.56 (0.07)	0.00 (0.00)	8.79 (0.07)	4.28 (0.03)	8.45 (0.06)
(v) Plant nutrients	3447.77 (22.94)	3480.41 (18.35)	3465.25 (19.83)	2066.78 (16.24)	2572.55 (19.16)	2312.78 (17.70)	2973.92 (19.06)
(a) N	1396.92 (9.30)	1444.67 (17.62)	1422.49 (8.14)	933.13 (7.33)	1083.54 (8.07)	1006.29 (7.70)	1245.05 (7.98)
(b) P <sub>2</sub> O <sub>5</sub>	1105.32 (7.35)	1106.31 (5.83)	105.85 (6.33)	684.38 (5.38)	859.85 (6.40)	769.72 (5.89)	962.55 (6.17)
(c) K <sub>2</sub> O	945.53 (6.29)	929.43 (4.90)	936.91 (5.36)	449.27 (3.53)	629.16 (4.69)	536.77 (4.11)	766.32 (4.91)
(vi) Plant protection chemicals	626.85 (4.17)	618.30 (3.26)	622.27 (3.56)	380.10 (2.99)	666.87 (4.97)	519.58 (3.98)	578.49 (3.71)
(vii) Herbicides	7.65 (0.05)	6.15 (0.03)	6.85 (0.03)	7.80 (0.06)	33.82 (0.25)	20.45 (0.16)	12.65 (0.08)
(viii) Miscellaneous expenses	565.68 (3.77)	986.88 (5.20)	791.25 (4.53)	555.09 (4.36)	236.65 (1.76)	400.20 (3.06)	624.54 (4.01)
Operational expenses	15030.13 (100.00)	18968.21 (100.00)	17472.87 (100.00)	12724.61 (100.00)	13428.06 (100.00)	13066.74 (100.00)	15594.43 (100.00)

Figures in parentheses indicate percentage to the respective total

being more risky, thus limited on few farms. Rubber is a steady income crop once established and tapping begins. It is comparatively free from pest/disease attack. The farmers have formed an impression that rubber is a "safe crop" and that is reflected by its growing acreage in Kerala in general, and in the study area in particular. Paddy was the least rewarding crop. Hence, it is fast losing its acreage in the study area. Farmers raise the crop mainly for home consumption, and straw for livestock. Coconut, with a low price prevailing during the reference year for the nuts, have proved a medium earner with a gross margin of Rs. 8691/ha. The defaulter borrowers of both agencies had lower gross margin as compared to the non-defaulters for all the crops (Table 5.2.17).

Table 5.2.17 Gross Income and Gross Margin of the Borrower Farmers

Particulars	(Rs/Ha)						Overall mean
	Non-defaulters			Defaulters			
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
<b>Gross Income</b>							
Paddy	22,251.07	21185.31	22,222.60	18,124.62	16,375.57	17,285.76	19,850.55
Banana	125546.55	208325.88	178467.66	119043.75	144821.88	131899.38	169699.79
Coconut	20419.05	21028.91	20720.00	14926.80	12628.29	13778.16	17618.97
Rubber	82380.26	85533.20	84594.24	69503.63	75936.97	72707.38	80391.08
Farm as a whole	73596.62	84910.56	81317.03	73289.74	65051.22	69039.63	76094.10
<b>Gross Margin</b>							
Paddy	7220.94	3217.10	4749.73	5400.01	2947.51	4219.02	4256.12
Banana	72764.97	154495.47	125016.02	73570.62	101465.56	87840.14	118047.98
Coconut	9824.53	11123.31	10481.28	7068.17	5879.86	6477.14	8691.31
Rubber	66478.35	69419.42	69198.01	55748.55	62575.83	59160.91	65225.36
Farm as a whole	58566.49	65942.35	63844.16	60565.13	51623.16	55972.89	60499.67

### 5.2.9 Resource Productivity

The tabular analysis carried out earlier has brought out the relative share of the various production inputs in the working capital requirement of the major crops cultivated. An attempt is being made now to assess the magnitude of contribution of the production inputs to the gross income of the various borrower groups.

The production function analyses were carried out using the Cobb-Douglas production function to measure the resources productivity due to its advantages and flexibilities in estimation, which have already been discussed in the chapter methodology. The estimated b coefficients give the elasticity of production directly. It indicates the percentage change in returns (or yield) associated with one per cent change in the input considered, when the other inputs are kept at their respective mean level. Application of Klein's (1962) test criteria indicated that there was no serious multicollinearity problem in all the models.

The elasticities of production in paddy cultivation for the different borrower groups are presented in Table 5.2.18. The F value was highly significant indicating the appropriateness of the model specified. The independent variables considered in the models could explain 83 to 94 per cent variation in the gross income. Human labour was the most important resource that contributed positively to the returns. The magnitude of production elasticity revealed that this major input was more productively utilized by the non-defaulters, thereby resulting in higher farm income. The coefficient of plant nutrient expenses was positive and significant for the borrowers of the cooperative societies only. It indicated that the provision of supplying kind components especially fertilizers

Table 5.2.18 Production Elasticities of Resources in Paddy Cultivation

Parameters	Non-defaulters			Defaulters		
	Cooperatives	Commercial banks	Pooled	Cooperatives	Commercial banks	Pooled
Constant	-2.4868	-4.0360	-1.9659	2.5901	2.0473	1.7402
Land	-0.1083 (0.0664)	-0.1600 (0.1723)	-0.0871 (0.0512)	0.0429 (0.0866)	0.1581 (0.1026)	0.0593 (0.0747)
Human Labour cost	1.1182** (0.2186)	1.2601* (0.4403)	1.0507** (0.1564)	0.2589 (0.2164)	0.8142** (0.1746)	0.6632** (0.1541)
Cost on plant nutrients	0.3778* (0.1537)	0.3244 (0.3611)	0.3781 (0.1257)	0.7015** (0.2027)	-0.0377 (0.1303)	0.2402* (0.1216)
Cost on plant protection chemicals	0.0030 (0.0092)	0.1202 (0.1403)	6.6142 <sup>E-04</sup> (0.0074)	-0.0707 (0.0822)	0.0443 (0.0524)	0.0270 (0.0466)
R <sup>2</sup>	0.9419	0.8332	0.9421	0.8847	0.9322	0.8994

through the outlets of the PACS has been effective. The commercial bank branches did not have such a provision. They had a system of reimbursing the commercial invoice produced by the borrowers for the purchase of production inputs, which leaves sufficient room for adjustments between the dealer and the borrower.

In the case of banana, the human labour contributed positively and significantly towards enhancing the gross income from banana for the borrowers of cooperative credit only. The pooled analysis indicated that this input was more responsive in the case of non-defaulters than that of the defaulter farmers (Table 5.2.19). The expenses on plant nutrients showed that this resource was contributing positively to the gross returns from banana cultivation for the non-defaulter borrowers of cooperatives as well as commercial banks. However, it was significant only in the case of defaulters of commercial banks, thereby bringing out the differences in resource productivity among the various borrower groups. The model



Table 5.2.19 Production Elasticities of Resources in Banana Cultivation

Parameters	Non-defaulters			Defaulters		
	Cooperatives	Commercial banks	Pooled	Cooperatives	Commercial banks	Pooled
Constant	3.2856	0.9238	2.3650	2.7647	1.1827	1.7744
Land	0.5794 (0.2946)	-0.1389 (0.2855)	0.4072 (0.2252)	1.1552 (1.4798)	0.1802 (1.0231)	0.7711 (0.7841)
Human Labour cost	0.4765** (0.1387)	0.2147 (0.2157)	0.4788** (0.1403)	0.1645 (0.1385)	0.4267 (0.2504)	0.3006* (0.1281)
Cost on plant nutrients	0.3283 (0.1262)	0.8427** (0.2076)	0.4009** (0.1363)	0.6855 (0.2588)	0.6318* (0.2655)	0.6838** (0.1732)
Cost on plant protection chemicals	-0.0263 (0.0941)	0.1902 (0.1225)	0.0734 (0.0905)	0.0293 (0.2270)	0.0986 (0.1851)	0.0618 (0.1392)
R <sup>2</sup>	0.9291	0.9079	0.8719	0.8603	0.8758	0.8885

specification was appropriate, as shown by the highly significant F value, with a good explanatory power, ranging from 86 to 91 per cent variation in the gross returns from banana cultivation.

The resources productivity analysis in coconut also revealed a pattern similar to the one exhibited by banana (Table 5.2.20). The F value of the regression equation was highly significant, indicating the appropriateness of model specification. The independent variables considered in the model could explain 93 to 95 per cent variation in the gross returns from coconut cultivation. Human labour was positively contributing to the gross returns from coconut. However, the magnitude of the regression coefficient of human labour was higher for the defaulter group as against the non-defaulter group. However, the elasticity of production of plant nutrients was higher for the non-defaulters than that of the defaulters. It implied that the non-defaulters could utilize the plant nutrients more productively

Table 5.2.20 Production Elasticities of Resources in Coconut Cultivation

Parameters	Non-defaulters			Defaulters		
	Cooperatives	Commercial banks	Pooled	Cooperatives	Commercial banks	Pooled
Constant	1.0391	1.1368	0.8860	0.9605	0.5215	0.8779
Land	0.1850 (0.2125)	-0.0972 (0.1332)	-0.0056 (0.1202)	0.3040 (0.1880)	-0.1198 (0.3436)	0.1965 (0.1596)
Human Labour cost	0.7116** (0.1391)	0.6389** (0.1189)	0.7558** (0.0893)	0.7769** (0.0877)	0.9436** (0.1114)	0.8257** (0.0662)
Cost on plant nutrients	0.3285** (0.0871)	0.4339** (0.0927)	0.3227** (0.0618)	0.2378** (0.0650)	0.1441 (0.0953)	0.2024** (0.0518)
Cost on plant protection chemicals	-0.0129 (0.0069)	-0.0012 (0.0052)	-0.0085 (0.0043)	-0.0075 (0.0041)	-0.0050 (0.0039)	-0.0061* (0.0028)
R <sup>2</sup>	0.9371	0.9517	0.9401	0.9464	0.9342	0.09415

to enhance their gross returns, while the defaulters managed the human resource more efficiently.

The resources productivity in rubber also presented a trend similar to that of the crops considered earlier (Table 5.2.21). Here also, the model specification was appropriate, with highly significant F value. The independent variables considered in the model could explain 67 to 95 per cent variations in the gross income from rubber cultivation. Human labour and plant nutrient expenses contributed positively to the gross income from rubber. As in the case of coconut, the non-defaulters utilised the plant nutrients more effectively. The defaulters utilised the human labour more productively. The area under the crop was also significant for the borrowers (both non-defaulters and defaulters) of commercial banks. However, further increase in cultivated area are severely constrained by the scarcity of land resource in the state. Moreover, rubber cultivation

Table 5.2.21 Production Elasticities of Resources in Rubber Cultivation

Parameters	Non-defaulters			Defaulters		
	Cooperatives	Commercial banks	Pooled	Cooperatives	Commercial banks	Pooled
Constant	2.3484	4.2943	4.5917	0.5892	3.8652	2.9384
Land	0.0563 (0.2385)	0.1244* (0.0450)	0.1465* (0.0648)	-0.2248 (0.1149)	0.4047* (0.1581)	0.1150 (0.1047)
Human Labour cost	0.8079** (0.3100)	0.2376* (0.0822)	0.2417* (0.1064)	0.6629** (0.1918)	0.4870** (0.1530)	0.5796** (0.1151)
Cost on plant nutrients	0.1499 (0.2763)	0.5905** (0.1118)	0.5195** (0.1267)	0.6216* (0.1978)	0.2879* (0.1205)	0.3392** (0.1043)
Cost on plant protection chemicals	0.0034 (0.0133)	-0.0256* (0.0093)	-0.0027 (0.0077)	-0.0082 (0.0042)	0.0067 (0.0056)	-5.2772 <sup>E-05</sup>
R <sup>2</sup>	0.6690	0.9390	0.8222	0.9504	0.9094	0.9085

requires land with special slope gradient, which have already been utilised for cultivating rubber. The expenses on plant protection chemicals was inversely related to the gross income from rubber for the non-defaulter borrowers of commercial banks. This is understandable. Higher expenses on protection chemicals are made only when more pest/disease incidences are encountered. More incidences of pest/disease results in reduction in yield, thereby lower gross returns also.

The results of the production function analysis brought out the differences in the resources productivity among the various borrower groups and crops. In the food crop paddy and the horticultural crop banana, the non-defaulters utilized the human labour more productively than the defaulters. However, they pursued a different strategy in the case of plantation crops like coconut and rubber. In these two crops, the non-defaulters exhibited better managerial ability with respect to plant nutrients.

The main reason for this change in managerial approach could be due to the fact that both coconut and rubber are perennial crops and effects of plant nutrition are carried over to the next seasons also.

#### 5.2.10 Allocative Efficiency

The resources productivity analysis carried out earlier had brought out the magnitude of the contribution of production inputs to the gross returns from crop production. However, the examination of allocative efficiency has always been an important criterion of production efficiency. Hence, an attempt is being made under this section to examine the allocative efficiencies of important production inputs as they were used by the various borrower groups. The allocative efficiency rule advises a farmer to produce a level of output by using a variable input intensity to the point where its value of marginal product ( $VMPX_i$ ) equals the per unit factor acquisition cost ( $PX_i$ ).

An examination of Table 5.2.22 revealed that all the major resources like human labour and plant nutrients were under-utilised by both non-defaulters as well as defaulters. The value of marginal products (VMP) were more than unity in all the groups and crops as far as these two production inputs were concerned, indicating the sub-optimal allocation. Land was intensively utilized for rubber cultivation by the non-defaulters, with a VMP of less than one. On the other hand, it was suboptimally utilized by the defaulters of commercial banks. Since agricultural intensification is the only alternative in view of shrinking per capita land availability in Kerala, there is scope for reallocating human labour and plant nutrients. However, human labour is a complementary input, and its scarcity is a major limiting factor in doing so. The predominance of part-time farmers

Table 5.2.22 Allocative Efficiency of the Borrower Groups based on VMPs

Particulars	Non-defaulters			Defaulters		
	Cooperatives	Commercial banks	Pooled	Cooperatives	Commercial banks	Pooled
i) Paddy						
a) Land	-	-	-	-	-	-
b) Human Labour	3.43	3.85	3.21	-	1.86	1.52
c) Plant nutrients	4.57	-	4.76	7.88	-	2.65
d) Plant Protection Chemicals	-	-	-	-	-	-
ii) Banana						
a) Land	-	-	-	-	-	-
b) Human Labour	2.46	-	5.25	-	-	1.83
c) Plant nutrients	3.33	12.50	4.63	-	7.98	7.68
d) Plant Protection Chemicals	-	-	-	-	-	-
iii) Coconut						
a) Land	-	-	-	-	-	-
b) Human Labour	2.21	1.91	2.30	2.03	2.41	2.14
c) Plant nutrients	2.13	3.94	2.44	1.84	-	1.62
d) Plant Protection Chemicals	-	-	-	-	-	-0.33
iv) Rubber						
a) Land	-	0.62	0.72	-	1.78	-
b) Human Labour	5.14	1.46	1.50	4.11	3.54	3.89
c) Plant nutrients	-	24.49	19.26	-	8.05	9.61
d) Plant Protection Chemicals	-	-14.05	-	-	-	-

among the borrowers is another reason for the sub-optimal level of farming, because profit maximisation is not the major goal of part-time farming.

The foregoing discussion brings out certain economic characteristics that distinguish a defaulter borrower from a non-defaulter borrower of crop loan. Even though there was no significant difference in the family size, and educational status, the defaulter farmers in general had relatively smaller size of holding, proportionately less area under irrigation, and less experience in farming, less dependency on agriculture as a source of income, less investment on fixed assets, share of cash crops in the cropping pattern, intensity of modern input use, yield level and thereby less gross profit as compared to the non-defaulter farmers. The scale of finance fell short of the working requirement for the small and marginal farmers in the case of paddy and banana while it was adequate for the other category of farmers. There was adequacy of scale of finance for all the category of borrowers in coconut but it failed to meet the working capital requirement in the case of rubber. It indicated the need to work out the scale of finance in a more realistic and scientific manner. The resources productivity analysis confirmed the labour-intensive nature of paddy, coconut and rubber cultivation. Human labour was positively contributing to gross returns in all the crops considered, viz., paddy, banana, coconut and rubber. It was also found that in general, the human resource was having higher production elasticity for the non-defaulter farmers than the defaulters, thereby indicating their better managerial skills. The allocative efficiency based on VMPs of major resources like human labour and plant nutrients revealed the sub-optimal allocation of these two resources due to the predominance of part-time farming and scarcity of labour.

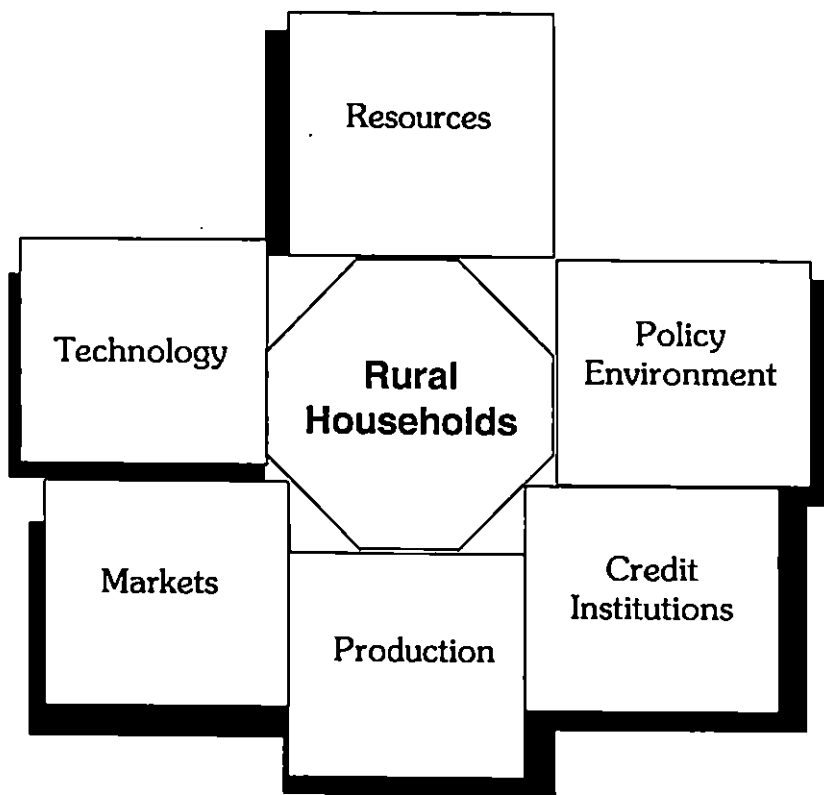
### 5.3 Pattern of Credit Supply, Timeliness, Repayment Behaviour and Overdues of the Borrowers

The test of sound rural banking system lies on timely delivery of credit for viable ventures, adequate amount of financing for the purpose, and realistically drawn up repayment schemes which in turn would help to increase the return on investment for debt servicing (Kahlon and Singh, 1992). Hence the pattern of credit delivery, its inadequacy, timeliness and effective utilization have a bearing on the effective recovery, and thereby on the repayment behaviour of the borrowers. The present section is therefore an attempt in this direction.

#### 5.3.1 Pattern of Credit Supply

The credit delivery system is a complex one. Broadly, the system comprises of three major segments; the financial institutions sandwiched between the borrowers (farmer clientele) on the one hand, the policy makers and policy environment on the other (Fig. 5.4). The borrowers, in turn, are operating in an environment influenced by resources, technology and the market factors over and above the credit policies and the agencies delivering them.

Credit supply to paddy crop did not show much pronounced variation among the different categories of borrowers (Table 5.3.1). On an average, Rs. 8357/ha was the disbursement for paddy cultivation. The kind component disbursal showed wide variation among defaulter and non-defaulter borrowers. Except the non-defaulter borrowers of the commercial banks, all other borrowers were disbursed kind components above the norm prescribed by the scale of finance. The non-defaulter borrowers of the commercial bank were however, given kind components nearly



**Fig. 5.4. The Borrower-Institution Linkage**



Table 5.3.1 Supply Pattern of Crop Loan to the Borrower Farmers

(Rs/ha cultivated)

Particulars	Non-defaulters			Defaulters			Overall mean
	Coopera-	Comm- ercial Bank	Average	Coopera-	Comm- ercial Bank	Average	
i) Paddy							
a) Cash	5632.75	6697.01	6093.44	7471.27	7074.87	7349.36	6696.88
b) Kind	1910.67 (+1.32)	1950.58 (-9.77)	1927.95 (+4.01)	1436.78 (+55.00)	1269.04 (+64.37)	1369.45 (+59.17)	1659.60 (+25.88)
c) Total	7543.42	8647.59	8021.39	8908.05	8343.91	8718.81	8356.48
ii) Banana							
a) Cash	23,700.97	29,464.96	25,529.43	30,091.37	15,808.00	22,102.91	24,904.27
b) Kind	2755.93 (-70.24)	10,210.63 (-26.47)	9388.56 (-23.18)	2507.61 (-78.02)	7904.00 (-4.76)	5525.73 (-42.86)	8680.45 (-26.15)
c) Total	26,456.90	39,675.59	34,917.99	32,598.98	23,712.00	27,628.64	33,584.72
iii) Coconut							
a) Cash	2018.88	2158.59	2087.83	0.00	6894.51	3826.06	2864.32
b) Kind	901.29 (-7.41)	231.28 (-70.97)	570.65 (-35.60)	754.31 (+200.00)	1130.25 (-57.75)	565.43 (-61.37)	568.32 (-50.33)
c) Total	2920.17	2389.87	2658.48	754.31	8024.76	4391.49	3432.64
iv) Rubber							
a) Cash	8158.77	6082.92	6700.63	7024.67	6869.70	7048.71	6823.71
b) Kind	1842.30 (-32.46)	1478.87 (-28.29)	1586.99 (-29.79)	1596.52 (-32.10)	212.46 (-89.00)	895.42 (-58.67)	1342.45 (-39.72)
c) Total	10,001.07	7561.79	8287.62	8621.19	7082.16	7944.13	8166.16

Figures in parentheses indicate the percentage deviation from the norm prescribed by the scale of finance.

10 per cent less than prescribed norm. There seems to be credit rationing in loan supply to paddy crop when one compare with the scale of finance (Rs. 10,000/ha) for paddy.

In case of banana, there was much variation in credit supply. While the non-defaulter borrowers of commercial banks received the highest amount (Rs. 39676/ha), the defaulter borrowers of commercial banks received the minimum of Rs. 23712/ha. There was inadequacies in supply

to all the categories of borrowers against the prescribed norm of Rs. 50,000/ha, confirming credit rationing in banana also. The kind component was also not disbursed as prescribed and the same was less by 78 per cent in the case of defaulters of cooperatives and 5 per cent in the case of defaulters of commercial banks.

There was much variation in the supply of credit per hectare of coconut and rubber cultivation too. One hectare of coconut cultivated received Rs. 3433 as against the prescribed norm of Rs. 10,500/ha. Similarly, the same was Rs. 8166/ha for rubber cultivation as against the prescribed norms of Rs. 11,000/ha. Thus, the credit rationing practised by the financial institutions resulted in inadequacy in capital for coconut and rubber cultivation when compared with the prescribed scale of finance. Under-financing is not desirable in institutional credit, because it will drive the borrowers to non-institutional sources of borrowing for supplementing the shortfalls, thereby defeating the very purpose of crop loan system (Table 5.3.2). Reducing normal family consumption expenses and borrowing from other sources were the two most important inadequacy management measures adopted by farmers irrespective of their repayment status (Table 5.3.3).

Similarly, the kind components were not insisted upto the prescribed level in the case of coconut and rubber, as was the case with paddy and banana. The proportion of loan meant for kind component disbursal was disbursed as cash. This leads to a number of problems. Firstly, kind components take the form of inputs like improved seeds, fertilisers, plant protection chemicals etc. which increases the farmer's capacity to repay the loans through their potential to improve the farm productivity. Secondly, by creating direct access to physical inputs, the kind components

Table 5.3.2 Details of Non-institutional Borrowing by the Sample Farmers

Particulars	Number	Percentage to the total
Non-defaulters	8	10.00
Cooperatives	5	12.50
Commercial banks	3	7.50
Defaulters	28	35.00
Cooperatives	10	25.00
Commercial banks	18	45.00
Overall Mean	36	20.00

Table 5.3.3. Score for Inadequacy Management Measures by the Borrower Farmers

Measures	Non-defaulters			Defaulters			Overall Mean
	Cooperatives	Commercial banks	Average	Cooperatives	Commercial banks	Average	
1. By reducing normal family consumption expenses	121	130	126	172	149	161	143
2. By borrowing from other sources	48	90	69	64	101	83	76
3. By leasing out a portion of land	0	0	0	0	0	0	0
4. By leaving some land fallow	0	0	0	0	0	0	0
5. By using cheap and inferior quality inputs	0	0	0	0	0	0	0
6 Others	127	93	110	79	48	64	87.

reduce the chances of loan diversion for non-productive uses. The scaling down of the kind components increases the chances of diversion of loan for purposes other than crop production to a greater extent.

### 5.3.2 Diversion of Loan

On an average, the utilization of loan amount for productive purposes was very high (Table 5.3.4). Generally, a farmer tended to utilize Rs. 84 out of every Rs. 100 received as loan for agricultural production purpose, leaving a meagre Rs. 16 to be utilized for purposes other than agricultural production. Again, the utilization of credit was very high by the non-defaulter borrowers (Rs. 90 out of every Rs. 100 received as loan) while the same was relatively lower in case of defaulter borrowers (Rs. 73 out of every Rs. 100 received as loan), implying thereby the higher level of diversion of loan by the defaulters.

Since money is fungible, credit can be borrowed ostensibly for agricultural purposes at concessional interest rate, and can be diverted to non-agricultural activities such as consumption, education and/or social ceremony. This gives rise to *agricultural illusion* (Ladman and Tinnermeier, 1981), a situation where some agricultural loans have the appearance of going to that sector, but in fact go elsewhere. It can be seen from the Table 5.3.3 that agricultural illusion was practised by farmers mostly for other purposes (nearly 49 per cent and 26 per cent respectively of the diversions by the non-defaulters and the defaulters), followed by diversion to food/clothing, medical expenses and educational expenses by the non-defaulters. The diversion of loan by the defaulters to other purposes was followed closely to social ceremony, repair/maintenance of house and medical expenses in that order.

Table 5.3.4 Diversion of Loan for Purposes Other Than Crop Production

(Rupees diverted per Rs. 100 advanced)

Category of borrowers	Amount diverted to food/clothing	Amount diverted to medical expenses	Amount diverted to educational expenses	Amount diverted for repair/maintenance of house	Amount diverted to social ceremony	Amount diverted for other purposes	Total amount diverted
<b>Non-defaulters</b>							
Cooperatives	3.64 (19.53)	1.57 (8.43)	1.13 (6.07)	2.37 (12.72)	0.76 (4.08)	9.16 (49.17)	18.63 (100.00)
Commercial Banks	0.46 (9.93)	0.88 (19.01)	0.99 (21.38)	0.00 (0.00)	0.00 (0.00)	2.30 (49.68)	4.63 (100.00)
Average	1.69 (16.85)	1.15 (11.47)	1.05 (10.47)	0.91 (9.07)	0.29 (2.89)	4.94 (49.25)	10.03 (100.00)
<b>Defaulters</b>							
Cooperatives	2.44 (9.71)	4.12 (16.40)	3.18 (12.65)	4.44 (17.67)	4.39 (17.47)	6.56 (26.10)	25.13 (100.00)
Commercial Banks	3.25 (10.94)	4.12 (13.87)	2.83 (9.53)	4.00 (13.47)	7.62 (25.66)	7.88 (26.53)	29.70 (100.00)
Average	2.82 (10.34)	4.12 (15.11)	3.01 (11.04)	4.23 (15.51)	5.91 (21.67)	7.18 (26.33)	27.27 (100.00)
Overall mean	2.13 (13.63)	1.93 (12.36)	1.81 (11.59)	1.47 (9.41)	2.47 (15.81)	5.81 (37.20)	15.62 (100.00)

Figures in parantheses indicate percentage to the respective total

### 5.3.3 Timeliness of Supply

It is said that '*credit delayed is credit denied*'. As the crop loan is advanced to meet the seasonal/production expenses of the crop, it would be logical to advance the loan when the farmers need cash the most i.e. when the inputs are procured and the farm operations are being carried out. Any delay in this aspect would lead to diversion of credit for purposes other than production. Hence, the timeliness of credit supply is of utmost importance in any credit delivery mechanism.

It can be seen from Table 5.3.5 that eventhough the delay in loan receipt did not vary significantly among the non-defaulter and defaulter group of borrowers, there was difference in the time taken in the receipt of loan amount between commercial banks and cooperatives. The commercial banks, on an average, took 9-10 days to process a loan application and disburse the loan. The cooperatives, on the otherhand, took 48-49 days to process and disburse a loan application. Most of the borrower farmers during the survey, complained about the cumbersome procedure and formalities being followed by the cooperatives in the processing of loan application. They suffered from lack of delegation of financial powers also. For example, every loan application exceeding Rs. 10,000/- had to be referred to the District Cooperative Bank concerned. The commercial banks, did not suffer from any such procedural rigidities, and loans upto Rs, 25,000/- were disbursed in a most flexible manner.

The reasons for the preference of institutional agency showed that the most preferred reason of a farmer approaching commercial banks is the timely disbursal of credit (Table 5.3.6). Timeliness in credit delivery was not the main consideration for a farmer, preferring the cooperatives, it was the concessional rate of interest (i.e. interest rebate) and the familiarity with the officials of the society.

#### 5.3.4 Cost of Credit Supply

Financial intermediation is not free, and any institution would like to charge an interest rate equal to or greater than the cost of funds. However, the administered interest rate regime prevalent in agricultural lending does not provide this liberty to the financial institutions. They

Table 5.3.5 Timeliness of Credit Supply to the Borrower Farmers

Category of Borrowers		Period of delay in crop loan receipt from the date of requirement (days)
a)	Non-defaulters	
	i) Cooperatives	49.00
	ii) Commercial banks	9.05
b)	Defaulters	
	i) Cooperatives	48.10
	ii) Commercial banks	10.98

Table 5.3.6 Borrower's Preference Towards Institutional Agency and the Reasons Thereof Based on Preference Scores

Reasons	Commercial Banks			Cooperatives			Overall mean
	Non-defaulters	Defaulters	Average	Non defaulters	Defaulters	Average	
1. Timely disbursement	203	270	237	0	0	0	119
2. Familiarity with officials	115	80	98	200	174	187	142
3. Easy access to loans	73	82	78	48	35	42	60
4. Flexibility in dealings	62	63	63	6	22	14	38
5. Technical support provided	51	8	30	0	0	0	15
6. Locational advantage	40	43	42	181	127	154	98
7. Concessional rate of interest	30	7	19	187	281	234	126
8. Others	0	42	21	6	8	7	14

have to follow the guidelines of the Reserve Bank of India from time to time.

The primary cost of credit is the interest payable. Credit involves some transaction costs other than the interest expenses like cost of documents, photographs, travel and legal costs (where equitable mortgage is to be created), cost of inspection etc. The interest cost along with the transaction cost constitutes the credit acquisition cost (Pollard and Grewal, 1983; Bedbak, 1985; and Gustafson, 1989).

A perusal of Table 5.3.7 makes it amply clear that the credit acquisition cost and the distribution of its components differed among the agencies concerned. Surprisingly, the credit acquisition cost of cooperative credit was higher than commercial bank credit, indicating the efficiency of the latter over the former. In spite of the interest cost constituting over 90 per cent of the credit acquisition cost, the commercial banks could scale down the credit transaction cost to less than 10 per cent. The interest rate of the cooperatives were less, and they had a system of interest rebate of 5 per cent on loans repayed within the time. Hence, interest cost constituted less than 80 per cent of their credit acquisition cost. However, this was offset by the higher credit transaction cost of the cooperatives.

Another interesting trend that emerged out of the analysis was that both the interest cost and credit transaction cost of the defaulter borrowers were higher than that of the non-defaulter borrowers. This gave rise to a higher credit acquisition cost to the defaulters as compared to the non-defaulters.



Table 5.3.7 Cost of Credit Supply to the Borrower Farmers

(Rupees per Rs. 100 advanced)

Reasons	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial banks	Average	Cooperatives	Commercial banks	Average	
Interest charges	10.17 (72.44)	11.21 (92.19)	10.81 (83.86)	14.51 (79.60)	14.68 (90.12)	14.59 (84.24)	12.28 (83.99)
Cost on share capital purchase	0.91 (6.48)	-	0.35 (2.72)	1.27 (6.97)	-	0.67 (3.87)	0.48 (3.28)
Cost on starting SB account and maintaining minimum balance	-	0.09 (0.74)	0.06 (0.47)	-	0.16 (0.98)	0.07 (0.40)	0.06 (0.41)
Cost of inspection	0.00 (0.00)	0.02 (0.16)	0.01 (0.08)	0.00 (0.00)	0.06 (0.37)	0.03 (0.17)	0.02 (0.14)
Cost of photograph	0.41 (2.92)	0.26 (2.14)	0.32 (2.48)	0.48 (2.63)	0.52 (3.19)	0.50 (2.89)	0.39 (2.67)
Cost of documents	0.79 (5.63)	0.16 (1.32)	0.40 (3.10)	0.28 (1.54)	0.30 (1.84)	0.29 (1.67)	0.36 (2.46)
Legal costs	1.47 (10.47)	0.20 (1.64)	0.69 (5.35)	0.75 (4.11)	0.00 (0.00)	0.40 (2.31)	0.58 (3.97)
Cost of gratification	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Cost of travel expenses	0.09 (0.64)	0.09 (0.74)	0.09 (0.70)	0.19 (1.04)	0.14 (0.86)	0.17 (0.98)	0.12 (0.82)
Indirect cost on account of loss of time	0.20 (1.42)	0.13 (1.07)	0.16 (1.24)	0.75 (4.11)	0.43 (2.64)	0.60 (3.47)	0.33 (2.26)
Credit transaction cost (CTC)	3.87 (27.56)	0.95 (7.81)	2.08 (16.14)	3.72 (20.41)	1.61 (9.88)	2.73 (15.76)	2.34 (16.01)
Credit Acquisition	14.04 (100.00)	12.16 (100.00)	12.89 (100.00)	18.23 (100.00)	16.29 (100.00)	17.32 (100.00)	14.62 (100.00)

Figures in parantheses indicate percentage to the respective total

### 5.3.5 Repayment Behavior and Overdues Level of the Borrowers

Credit is neither a charity nor a government subsidy. It is a financial service given for a prescribed period of time as stipulated by the terms of contract. Hence, the financial liability is to be liquidated by repaying the loan amount and the interest when it falls due. Since, crop loans are self-liquidating in nature (Van Horne, 1996), the repayment is made out of the gross income - and not the net income. Hence, the financial capacity of the borrowers to debt-servicing can be gauged from the financial surplus left after meeting the production expenses, consumption expenses, and the pre-existing liability (if any).

The repayment capacity, repayment obligation and the financial surplus/deficit are presented in Table 5.3.8. It can be seen that, on an average, a borrower had generated an annual repayment capacity of over Rs. 24,000. After debt-servicing, he was left with a financial surplus of over Rs. 15,000. The repayment obligation of the non-defaulters were higher than that of the defaulters, indicating their capability to obtain greater volume of loan. Since they generate relatively higher repayment capacity by utilizing the money in production ventures more effectively, they were able to generate enough financial surplus after debt-servicing.

However, the repayment behaviour is a complex one. Sufficient financial ability need not always be translated into prompt repayment. It should be supported by the willingness to pay. Table 5.3.9 amply illustrates this. More than 50 per cent of the defaulters had failed to meet the loan obligation of timely repayment in spite of having the necessary financial ability to do so, suggesting that they had defaulted wilfully. The extent of wilful default was nearly 53 per cent in the case of cooperative

Table 5.3.8 Repayment capacity and repayment obligation of the borrower farmers

Particulars	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial banks	Average	Cooperatives	Commercial banks	Average	
a) Repayment capacity							
i) Per Borrower (Rs)	22,692.03	49,617.08	36,154.55	14,609.91	11,209.58	12,909.74	24,532.15
ii) Per ha cultivated (Rs/ha)	22,590.37	42,837.97	33,433.87	17,698.26	14,339.08	16,064.39	26,028.80
b) Repayment obligation							
i) Per Borrower (Rs)	9032.95	14,513.25	11,773.10	7310.15	7091.93	7201.04	9487.07
ii) Per ha cultivated (Rs/ha)	8992.48	12,530.33	10,887.16	8855.42	9071.86	8960.69	10,065.86
c) Financial Surplus/deficit after debt servicing							
i) Per Borrower (Rs)	+13,659.08	+35,103.83	+24,381.45	+7299.76	+4117.65	+5708.71	+15,045.08
ii) Per ha cultivated (Rs/ha)	+13,597.89	+30,307.64	+22,546.71	+8842.84	+5267.22	+7103.70	+15,962.94

Table 5.3.9 Overdues Level of the Defaulter Farmers

Particulars	Cooperatives	Commercial banks	Average
a) Loans advanced			
i) Per Borrower (Rs)	7125.00	7887.50	7506.25
ii) Per ha cultivated (Rs/ha)	8631.13	10,089.54	9340.49
b) Overdues			
i) Per Borrower (Rs)	6491.88	5182.40	5837.14
ii) Per ha cultivated (Rs/ha)	7864.17	6629.23	7263.51
iii) Per Rs. 100 advanced (Rs)	91.11	82.10	86.88
c) % Wilful defaulters	52.50	57.50	55.00

credit and as high as 58 per cent in the case of commercial bank credit. The proportion of overdue to amount advanced was found to be very high and varied widely across the sources of finance. On an average, Rs. 87 out of every Rs. 100 advanced became an overdue. Every Rs. 91 out of Rs. 100 advanced as loan to the defaulters resulted in overdue in the case of cooperative credit while every Rs. 82 out of Rs. 100 advanced became an overdue in the case of commercial bank credit, indicating the slightly better recovery performance of the commercial banks.

As the Khusro Committee (1989) has rightly pointed out, the non-recovery of loans in time and continuous mounting of overdues severely limits the capacity of the financing agencies to recycle the funds and thus impedes the process of development as non-repayment of loans by a section of agricultural borrowers results in the non-availability of loans to other sections of agricultural borrowers. The lack of recovery below 80 per cent cripples the credit institutions' capacity to draw refinance from NABARD because all the client banks are supposed to achieve and maintain 80 per cent recoveries each year from June 30, 1992 in respect of their current demand as a pre-condition for unrestricted refinance from NABARD. Hence, both the cooperatives and commercial bank branches have to launch a more vigorous recovery campaign in their respective service areas to fulfil the NABARD norm.

The farmers' perception in default are quantified and ranked by score, and are presented in Table 5.3.10. In general, crop failure was the highest ranked reason by the defaulter group of borrowers for non-repayment of the loan. Gall fly attack in paddy and cyclonic damages to banana crop during the year under report was reported to be the main

Table 5.3.10 Score for Reasons of the Default in Crop Loans by the Borrowers

Reasons	Score of borrowers of		
	Cooperatives	Commercial banks	Average
Inadequacy of loan	35	56	46
Untimely disbursal	0	25	13
Fear of non-renewal	0	32	16
Crop failure	187	213	200
Low income due to price fall	8	17	13
Lack of supervision by bank officials	0	0	0
Anticipation of writing off	57	57	57
Diversion of loan for non-productive purposes	239	157	198
Others	93	44	69

cause for crop failure. Most of the defaulters admitted during the course of survey that their damage was not so heavy to warrant non-repayment. They were waiting for the government compensation for crop damage which would be utilized to close the loan amount. A section of farmers had a faint hope of the loan being written-off in the event of crop damage, and were waiting for the government decision in this regard. The second most ranked reason for default was the diversion of loan for non-productive purposes. For every loan diverted for non-productive purposes, it increases the chances of default because it fails to generate incremental income commensurating with the utilization of the loan in productive ventures. There were differences in the reasons for default among the borrowers of the two institutional agencies. While the borrowers of cooperatives found that diversion of loan for non-productive purposes was deterring

them from non-repayment more than crop failure, the borrowers of commercial banks considered crop failure as more deterrent to non-repayment than diversion of loans. Anticipation of loan write-off was also an important consideration in non-repayment by the borrowers of both the agencies while inadequacy of loan amount, untimely disbursal, low income due to price fall, lack of supervision by bank officials etc. were relatively unimportant reasons in the non-repayment decision of the defaulter farmers.

The foregoing discussion illustrated that the existing credit supply by different financial institutions were inadequate to meet the operational expenses of the borrowers. The credit rationing led the farmers to non-institutional sources of credit to supplement their credit needs. This defeated the very purpose of institutionalised credit whose main objective was to wean the farmers away from the clutches of the village moneylenders. Generally, the kind component disbursement were less than the norm prescribed by the scale of finance, contributing to higher degree of loan diversions. The magnitude of loan diversion was more among the defaulters than that of non-defaulters. The timeliness of credit was observed more by the commercial banks while the borrowers of cooperatives suffered from delay exceeding one month due to various procedural rigidities. The cooperatives could ensure loan to its members at higher credit acquisition cost despite the interest subsidy facility available. There was a positive financial surplus left with all categories of borrowers after debt-servicing, thereby indicating the high incidence of wilful default. The recovery performance of the commercial banks were higher than that of the cooperatives. Crop failure and diversion of loan for non-productive

purposes were the most important reasons that were perceived by the farmers influencing their repayment decision. The writing-off of the loan in the past have given an impression of similar debt relief schemes in future, and it was found to vitiate the recovery climate. Politicisation of agricultural credit programmes are counter-productive and hence, shall be desisted from as they shall undermine the long-run viability of the financial institutions.

#### 5.4 Factors Influencing the Overdues and Screening the Potential Defaulters

Repayment of loan together with interest thereon by the borrowers is central to the smooth functioning of institutional credit. The assumption, while providing credit, is that application of credit in the production process would generate sufficient additional gains to meet the repayment obligation and leave a reasonable surplus to the producers. Credit can said to be effective only if this basic postulate is borne out (Reserve Bank of India, 1989). It is in this context that the factors influencing the overdues assume significance, and the evolution of a credit screening device to weed out the potential defaulters based on such factors become important. It will provide the lenders sufficient *a priori* information to discriminate between desirable borrowers from undesirable borrowers and improve their loan recovery performance.

The factors influencing the repayment behaviour of all crop loan borrowers were identified using the logistic regression. The signs of the estimated coefficients were as expected according to a *a priori* reasoning. The results indicated that the probability of repayment is directly related to his operational expenses, per capita consumption expenses, and inversely

Table 5.4.1 Logistic Regression Coefficients of Factors Influencing Repayment Behaviour (Pooled for All Borrowers)

Factors	Coefficient	SE	Wald statistic
Constant	-2.8818	0.8588	11.2598
Per capita consumption expenditure	0.0006**	0.0001	21.4850
Operational Expenses	0.0002**	4.912E-05	17.5932
Credit Acquisition Cost	-0.0013**	0.0004	12.4108
Amount Diverted	-0.0003**	0.0001	8.2059
Educational status	-0.9318	0.3568	6.8198
Loan Amount	7.34E-05**	3.778E-05	3.7686
-2 Log Likelihood	140.496**		
Model chi-square (G <sup>2</sup> ) statistic	81.311 <sup>ns</sup>		
Number of observations	160		
% Correct Prediction	78.75		

\*\* Significant at 1% level; \* Significant at 5% level; ns Non-significant

related to the educational status, amount diverted for other purposes and the credit acquisition cost (Table 5.4.1). This finding is perfectly in agreement with the earlier findings. The financial ability to repay the loan was conditioned by the financial surplus of gross income over the operational and the consumption expenses of the farm household. The amount diverted for non-productive purposes reduces the income-generating capacity of the farm and resulted in less repayment. Relatively higher acquisition cost of credit is a deterrent in prompt repayment and also to have continued access to concessional lending in future. The analysis of farming status under section 5.2.4 had clearly illustrated that the part-time farming was prevalent and thus dependence on the success of farming remain less among the defaulters. The more educationally accomplished had taken up alternative employment in the other sectors of the economy.



They tended to attach less importance to maintaining a good customer relationship with the financial institutions by timely repayment and renewal of crop loan. This resulted in an inverse relationship between educational status and better repayment. The model chi-square ( $G^2$ ) statistic was non-significant, implying that the expected frequencies considered by the model are reasonably close to those observed in the table, and hence the goodness of fit of the model. The model provides 79 per cent correct predictions of the binary dependent variable viz., repayment/default, thereby illustrating its predictive efficacy.

However, inter-institutional differences existed in the personal characteristics and socio-economic aspects of the farm households. The share of cash crops in the cropping pattern had a positive influence on the repayment behaviour of crop loan borrowers of commercial banks, whereas the amount diverted and experience in institutional credit dealing had an inverse relationship (Table 5.4.2). Diversion of any kind reduces the incremental income generating capacity, thereby the repayment capacity also. As the experience in institutional credit increases, farmers become more familiar with the procedures of crop loan system and become more aware about the outcome of delinquency. They understand from fellow farmers also that the banks are not prompt in following up default through immediate revenue recovery measures. As they gain more familiarity with the bank officials, more experienced borrowers gain more confidence of handling them, and thereby less afraid of the consequences of default. This explained the inverse relationship between experience in institutional credit and repayment behaviour. The model fitted well into the data with a non-significant  $G^2$  statistic and predicted default with 93.75 per cent accuracy.

Table 5.4.2 Logistic regression coefficients of factors influencing repayment behaviour of crop loan disbursed by commercial bank

Factors	Coefficient	SE	Wald statistic
Constant	-0.5579	6.7519	0.0068
Experience in institutional credit	-0.3882**	0.1644	5.5772
Amount diverted	-0.0008**	0.0005	2.7265
Share of cash crops	4.0230**	2.4957	2.5985
Trainings attended	-1.8893	1.2316	2.3531
Operational Expenses	0.0003	0.0002	2.0264
Delay in credit delivery	-0.2235	0.1716	1.6967
Size of operational holding	-2.1653	1.7495	1.5319
Area under irrigation	2.4648	2.0824	1.4010
Credit Aquisition cost	-0.0016	0.0014	1.2783
Loan Amount	6.85E-05	7.002E-05	0.9558
Full time farming status	0.0377	1.4705	0.0007
Pre-existing liabilities	-0.0039	0.0053	0.5381
Per capita consumption expenses	0.0001	0.0003	0.1484
Experience in farming	0.0882	1.1383	0.4062
Age	0.263	0.1608	0.0267
-2 Log likelihood	33.635**		
Model Chi Square (G <sup>2</sup> ) statistic	77.269 <sup>ns</sup>		
Number of Observations	80		
% Correct Prediction	93.75		

\*\* Significant at 1% level; \* Significant at 5% level; ns Non-significant

On the other hand, the per capita consumption expenditure, credit acquisition cost, operational expenses, experience in farming, delay in credit delivery, loan amount and age were the factors influencing the repayment behaviour of borrowers of PACS. The per capita consumption expenditure, operational expenses, experience in farming and the volume of loan had a direct relationship. On the other, the credit acquisition cost, delay in credit delivery, amount diverted and age had an inverse relationship with repayment behaviour. This is perfectly in accordance with the earlier findings. Zeller (1994) has reported consumption expenses as a productive expenditure. Hence, more of this productive expenditure could lead to higher productivity and better recovery. The higher operational expenses is only a reflection of the higher share of cash crops in the cropping pattern. The cooperative credit institutions had a higher credit transaction cost and it took on an average more than one month in disbursing loan from the date of farmers' need. Naturally, delayed credit receipt led to higher diversion to non-productive purposes. Moreover, higher credit transaction cost discouraged the negotiation and contracting fresh loans. As the age advanced, the borrowers became more familiar with the ways of working of the PACS, and realized that default cannot bring any immediate punitive measures. The data fitted well into the model with a non-significant  $G^2$  statistic, and it had a predictive efficacy of 86.25 per cent (Table 5.4.3).

Having established the log odds ratio associated with one unit change in the discriminant economic characteristics, the information can be used to screen potential defaulters of crop loan. For instance, a farmer with a primary school educational attainment and having a cultivated area of

**Table 5.4.3** Logistic Regression Coefficients of Factors Influencing Repayment Behaviour of Crop Loan Disbursed by PACS

Factors	Coefficient	SE	Wald statistic
Constant	2.6810	3.2651	0.6742
Per capita consumption expenditure	0.0013**	0.0004	9.9641
Credit Acquisition Cost	-0.0068**	0.0023	8.9196
Operational Expenses	0.0004**	0.0002	6.3479
Experience in farming	0.4412**	0.1846	5.7127
Delay in Credit delivery	-0.1017**	0.0479	4.5115
Loan Amount	0.0012**	0.0006	4.2747
Age	-0.1777**	0.0891	3.9834
Amount Diverted	-0.0008*	0.0005	2.5326
Educational Status	-1.2444	0.8748	2.0235
Full time farmer status	1.2966	1.1041	1.3791
Size of Operational holding	-1.1946	1.4519	0.6770
-2 Log likelihood	46.120**		
Model Chi square ( $G^2$ ) statistic	64.784 <sup>ns</sup>		
Number of Observations	80		
% Correct Prediction	86.25		

\*\* Significant at 1% level; \* Significant at 5% level; ns Non-significant

0.40 ha with a working capital requirement of Rs. 8800/- applies for a crop loan of Rs. 3000/-. Assuming a credit acquisition cost of Rs. 1050 and no possible diversion of loan, the probability of repayment irrespective of any institution works out to be 0.13 with an annual gross income of Rs. 60,000 and a family consumption expenditure of Rs. 32,000/-. Since the applicant carries a low probability of repayment, he can be screened out at the preliminary stage itself because he is a potential defaulter. Likewise, financial institutions can use the agency-specific log odds ratio for credit screening of specific cases.

The farmers perception of improving the recovery performance also showed that the relative importance of factors influencing the repayment behaviour varied among the PACS and the commercial bank borrowers, reinforcing the earlier findings. While the borrowers of PACS considered the timeliness in credit disbursal as the most important factor contributing to improved recovery, followed by the adequacy of amount and lower interest rates, the borrowers of commercial banks perceived the adequacy of loan amount followed by the timeliness in credit supply, and proper supervision and follow up of loans as the more important factors that could improve the recovery performance of credit institutions (Table 5.4.4). The distribution of farmers who ranked the improvement measure as their first choice is presented in Appendix-II.

Table 5.4.4 Farmers Perception of Improving the Recovery Performance Based on Scores

Measures	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial banks	Average	Cooperatives	Commercial banks	Average	
Adequacy of amount	151	162	157	77	130	104	130
Timeliness in supply	164	122	143	164	125	145	144
Low interest rate	30	44	37	94	25	60	48
Proper supervisors and follow up	30	78	54	76	138	107	81
Insistence on cash and kind components	29	20	25	14	39	27	26
Others	62	4	33	17	5	11	22

On an average, nearly half of the borrowers did not face any limitations while dealing with the financial institutions (Table 5.4.5). Of the remaining half, rigid formalities in credit transaction was the most cited limiting factor faced by the borrowers while dealing with the financial institutions. The frequency distribution of farmers ranking the limiting factors as their first choice is depicted in Appendix III. The financial institutions shall simplify their loan transaction formalities, at least for amounts upto Rs. 25,000/-. Cumbersome procedures and preoccupation with paper works was the next most cited limitation. Here again, the credit agencies can simplify the procedures less rigorous for farmers who may find a more customer-friendly banking more attractive.

**Table 5.4.5 The Factors Limiting Receipt of Crop Loan From the Financial Institutions**

Limiting Factors	Non-defaulters			Defaulters			Overall mean
	Cooperatives	Commercial banks	Average	Cooperatives	Commercial banks	Average	
% Borrowers who did not face constraints	45	55	50	35	63	49	49
% Borrowers who faced constraints	55	45	50	65	37	51	51
Types of constraints faced and the scores thereon							
a) Rigid formalities	79	40	60	89	40	65	62
b) Preoccupation with paper works	29	24	27	14	15	15	21
c) Cumbersome procedures	34	5	20	37	24	31	25
d) Demand for gratification	0	0	0	0	0	0	0
e) Others	9	25	17	8	4	6	12

The foregoing discussion clearly illustrated that the repayment behaviour of crop loan borrowers were conditioned a host of factors like operational expenses, per capita consumption expenditure, loan amount, amount diverted to non-productive uses, credit acquisition cost etc. There were differences in the economic characteristics and their relative importance in influencing the repayment behaviour of crop loan borrowers of PACS and commercial banks. Rigid formalities in credit transactions was the most limiting factor faced by the borrowers while dealing with the financial institutions. Cumbersome procedures and pre-occupation with paper works made agricultural banking less customer-friendly.

## Chapter VI

### SUMMARY AND CONCLUSIONS

Capital has been one of the most limiting factors in crop production in India. Hence, institutional credit was evolved in India from the angle of liberating farmers from the clutches of private moneylenders by providing cheap, adequate and timely source of credit. With the advent of the high-yielding varieties programme, credit was expected to play the role of production enhancement through the adoption of the modern technology. The credit policy in India had given special emphasis in giving preference to the small and marginal farmers and agricultural labourers in providing institutional credit.

Kerala ranked first among the Indian states with regards to the growth in the flow of production credit. However, the increased flow of institutional credit at concessional rates was accompanied by many related issues such as inadequacy, misutilization and diversion of loan, lack of timeliness in credit delivery and high credit transaction costs. The mounting overdues level of the credit institutions has been a matter of growing concern, which has directly or indirectly influenced the repayment behaviour of the borrowers. It is in this context that the present study attempted to examine the institutional credit supply and repayment behaviour of farmers in Kerala.

The specific objectives of the study were :

1. to examine the growth in credit institutions, their disbursement and recovery performance in Kerala



2. to study the economic characteristics of the borrowers and the extent of their credit need in crop production
3. to examine the pattern of credit supply, timeliness, repayment behaviour and overdues of the borrowers, and
4. to identify the factors influencing the overdues in order to screen the potential defaulters and suggest suitable policy prescription.

Kottayam district in Kerala was purposively selected for the study because the district topped in the institutional credit disbursal to agriculture. Among the eleven blocks in the district, Madappally block was chosen for detailed investigation because of the higher target, achievement and credit absorption capacity with regards to crop loans. Finally, a cluster of four villages, viz., Changanasserry, Madappally, Trikkodithanum and Vazhappally were selected based on concentration of lending, and a total of 160 crop loan borrowers were selected by stratified random sampling.

Primary as well as secondary data were used for examining the objectives of the study. The time series data on agency-wise disbursal of credit to agriculture was collected from the State Level Bankers' Committee, Trivandrum to study the growth in the functioning of the credit institutions in the state. Primary data on the various aspects of credit at the household level were collected through personal interview of the sample respondents with the help of a pre-tested, structured survey schedule. The secondary data pertained to the period from 1985-86 to 1996-97. The primary data pertained to the agricultural year 1996-97.

The economic characteristics of the borrowers like farm size and family composition, educational status, size group status, farming status,

investment pattern on capital assets, cropping pattern, working capital requirements, gross income, gross margin and overdues level were examined by tabular analysis. Compound growth rates were worked out in nominal as well as real terms to study the growth in the functioning of the credit institutions in terms of number, deposits, advances and recovery levels. Production function analysis was carried out, using the Cobb-Douglas production function, to analyse the resources productivity among the various borrower groups and their allocative efficiencies were compared. Frequency distribution analysis was carried out to quantify the farmers' perception to different dimensions of credit. The factors influencing the repayment behaviour of crop loan borrowers were examined using a logit model based on logistic cumulative distribution function.

### **Growth in Credit Institutions, Disbursement and Recovery Performance in Kerala**

The commercial banks were the major purveyors of agricultural credit in Kerala, accounting for more than half of the total credit disbursed to the farm sector. They could achieve a high growth rate in deposit mobilisation and credit delivery through the proliferation of their branches in the state during the eighties and the early nineties. On the other hand, the growth in lending by the cooperatives appeared to be less attractive than that of other financial institutions. The relative share of the cooperatives in agricultural lending has been declining over the years. This amounted to a role reversal considering the major role visualised for the cooperatives in the multi-agency credit programme in rural lending.

The inter-regional and inter-temporal variations in the flow of all forms of institutional credit, resulted in regional imbalances in credit

delivery. Inter-regional differences existed in credit deepening also. Eventhough the state received a high credit receipt of Rs. 2027 per hectare of cropped area, only the districts of Kottayam, Alappuzha, Idukki, Ernakulam, Palakkad, Koghikkode, Wayanad and Kollam experienced credit deepening in real terms.

The recovery of overdues to demand has been fluctuating from year to year. On an average, the financial institutions in the state had an overdues of 23 per cent to demand, with a loan recovery rate of 77 per cent. The recovery performance of the PACSs were better (79 per cent) than that of the commercial banks and regional rural banks (68 per cent) on account of the peer group pressure exerted by their democratic mode of management.

#### **Economic Characteristics of the Borrowers and the Extent of Their Credit Need in Crop Production**

There was not much pronounced variation in the size of family, gender composition, experience in farming, educational status, size group composition and cropping intensity among the defaulter and non-defaulter group of farmers. However, the average size of operational holdings, share of irrigated area, share of cash crops in the cropping pattern, investment on fixed assets, and intensity of modern input use of the non-defaulter borrowers were higher than that of the defaulter borrowers. The resource productivity varied widely among the borrower groups. Production of major crops like paddy, coconut, banana and rubber were labour intensive, and they utilised the labour resource more productively. The better managerial skills of the non-defaulter borrowers helped them in harnessing higher yield and thereby higher gross profit. They depended more on agriculture for

the gross income (69 and 51 percentage of shares respectively), and hence placed more importance on maintaining better customer relationship with the credit institutions.

On an average, 88 per cent of the non-defaulter borrowers were the small and marginal farmers while 94 per cent of the defaulter borrowers formed small and marginal farmers. It amply illustrated the free access of small and marginal farmers to institutional form of credit, thereby indicating the effectiveness of the agricultural credit policy that placed greater thrust on progressive improvement in accessibility of credit and inputs to the small and marginal farmers.

However, the estimation of the working capital requirement and comparison with the scale of finance showed that it fell short of the credit needs of the farmers, particularly that of the small and marginal farmers. It underlined the need for working out the scale of finance in a more realistic and scientific manner, keeping the production requirements of the farmers in the area.

#### **Pattern of Credit Supply, Timeliness, Repayment Behaviour and Overdues of the Borrowers**

The analysis of the pattern of credit supply showed that not only the scale of finance was inadequate with respect to the credit needs of the borrowers, there was widespread credit rationing practised by both commercial banks and PACSs from the level of approved scale of finance as well. This led to acute shortage in working funds among all the categories of borrowers who were driven to the private moneylenders to meet the shortfalls. Thus, the basic objective of providing institutional credit to wean away the cultivators from the clutches of village

moneylenders was defeated. While 10 per cent of the non-defaulters depended on non-institutional sources of fund to meet the short fall caused by credit rationing, it was as high as 35 per cent in the case of defaulters.

Another interesting finding that emerged out of the analysis was the disbursal of kind components in proportions lower than the norm prescribed by the scale of finance. There was considerable delay in the disbursal of credit to the farmers by all sources of institutional credit to the farmers. However, the delay was more pronounced in the case of cooperative lending. It resulted in agricultural illusion among the borrowers, who indulged in the diversion of loan availed for agricultural production at concessional rate of interest for other non-productive purposes. The extent of diversion was more in the case of defaulters than the non-defaulters.

The credit acquisition cost of the defaulters were also higher than that of the non-defaulters. The defaulters had to spend nearly Rs. 15/- for transacting Rs. 100/- as loan while the non-defaulters could transact a loan amount of Rs. 100 for Rs. 13/-. The commercial banks could ensure credit to its borrowers at a lower credit transaction cost than the cooperatives. The cooperatives could not dispense cheaper loans to its member borrowers in spite of their interest subsidy facility.

The repayment obligation of the non-defaulter borrowers were higher than that of the defaulters, indicating the higher volume of credit made available to them. They could generate higher repayment capacity also, thereby having a higher financial surplus after debt servicing. The analysis also revealed that more than half of credit delinquency was due to wilful default.

Among the factors perceived by the borrower farmers that influenced their non-repayment decision, crop failure and diversion of loan for non-productive purposes were the most important one. The agricultural debt relief scheme, 1989 had given an impression of similar loan write-offs in future also, thereby vitiating the recovery climate.

#### Factors Influencing the Overdues and Screening the Potential Defaulters

The analysis of the factors influencing the repayment behaviour of crop loan borrowers using logistic regression showed that the repayment behaviour of the borrowers were conditioned by a host of factors like operational expenses, per capita consumption expenditure, loan amount, amount diverted to non-productive uses and credit acquisition cost.

There were differences in the economic characteristics and their relative importance in influencing the repayment behaviour among the borrowers of commercial banks and cooperatives. Higher share of cash crops in the cropping pattern resulted in better recovery of commercial bank loans whereas the experience in institutional credit, loan amount diverted for other purposes resulted in lower recovery. On the other hand, the per capita consumption expenditure resulted in better recovery of cooperative credit. Higher credit acquisition cost, more delay in credit delivery, more advanced age and more educational status contributed to lower repayment of cooperative loans.

The farmers perception of improving the recovery performance of credit institutions also showed that there were differences in the factors influencing the repayment behaviour of borrowers of commercial bank and PACSs. The borrowers of PACSs viewed that timeliness in credit disbursal,

followed by the adequacy of loan amount and lower interest rates were the more important factors influencing their repayment decision. The borrowers of commercial banks, on the other hand perceived that the adequacy of loan amount, followed by the timeliness in credit supply and proper supervision of loans improved the recovery performance.

Rigid formalities in credit transaction was the most important limiting factor faced by borrowers while dealing with the financial institutions. Cumbersome procedures and pre-occupation with paper works were other factors that made the agricultural banking less customer-friendly to the borrower farmers.

### Policy Implications

Based on the insights provided by the study, the following policy measures are being suggested that could make the crop loan scheme more efficient and meaningful.

Firstly, in view of the regional imbalances in credit delivery, concerted efforts are required to reduce the regional imbalances in credit delivery in the different districts of the state.

Secondly, the cooperatives played only a supplementary role to the commercial banks in credit dispensation to the agricultural sector. Keeping in view of the democratic nature of cooperative credit, they are to be revitalised and geared to play the major role in the multi-agency approach in agricultural finance.

Thirdly, the small and marginal farmers were receiving inadequate credit matching to their credit requirement. Policy interventions are needed

to correct credit gaps so created. Scale of finance shall also be evolved in a more realistic and scientific manner to meet the credit needs of the farmers, particularly that of the small and marginal size groups adequately.

Fourthly, credit rationing practised by the financial institutions defeated the very purpose of weaning the farmers away from the clutches of village moneylenders. Hence, policy perspectives need to be framed to overcome this pitfall.

Fifthly, considering the higher incidence of diversion of production credit to non-productive purposes, effective supervision and follow up of loans are needed to keep agricultural illusion at minimal levels.

Lastly, the practices and procedures followed by the financial institutions were cumbersome and rigid. It needs simplification to offer more customer-friendly banking facilities to the farmer borrowers.



## BIBLIOGRAPHY

- Adams, W. Dale (1971), "Agricultural Credit in Latin America : A Critical Review of External Funding Policy", *American Journal of Agricultural Economics*, 53 (2) : 163-172.
- Ajjan, N. (1994), "An Analysis of Performance of Cooperative Credit Institutions in Tamil Nadu", *Indian Journal of Agricultural Economics*, 49 (3) : 510-511.
- Anandam, M.A. Arul and N. Namasivayam (1988), "Cooperative Overdues - The Influence of Socio-Economic Factors of Borrowers - A Case Study", *Indian Cooperative Review*, 25 (3) : 293-300.
- Anderson, W. Ronald, Christopher L. Gilbert and Andrew Powell (1989), "Securitization and Commodity Contingency in International Lending", *American Journal of Agricultural Economics*, 71 (2) : 523-530.
- Babu, C.V. (1992). "Interseasonal and Interfarm Demand for Production Credit and its Gap on Paddy Cultivation - A Micro level Approach", *Agricultural Banker*, 15 (3) : 30-45.
- Babu, K. Sathees and Mathew Sebastian (1991), "Seasonality in Production Credit Delivery : A Macro-Level Analysis", *Agricultural Banker*, 14 (3) : 7-14.
- Babu, K. Sathees, R. Balakrishnan Asan, S. Rageena, C. Bhaskaran, N. Mohanakumaran and U. Mohammed Kunju (1993), *Trends in Area, Production and Productivity of Major Crops in Kerala*, National Agricultural Research Project (Southern Zone), Kerala Agricultural University, Vellayani, 132 p.
- Baker, C.B. (1968), "Credit in the Production Organization of the Firm", *American Journal of Agricultural Economics*, 50 (3) : 507-520.
- Baker, C.B. and Vinay K. Bhargava (1974), "Financing Small-Farm Development in India", *The Australian Journal of Agricultural Economics*, 18 (2) : 101-118.

- Balishter (1990), "Loan Waiver Scheme - Consequences and Possibilities", *Yojana*, 34 (19) : 23-25.
- Balishter, Umesh Chandra and A.K. Singh (1990), "Loan Overdues - A Study in Etah District of U.P.", *Agricultural Banker*, 15 (2) : 15-20.
- Barry, J. Peter, C.B. Baker and Luis, R. Sanint (1981), "Farmers' Credit Risks and Liquidity Management", *American Journal of Agricultural Economics*, 63 (1) : 216-217.
- Barry, J. Peter and Michael D. Boehlje (1986), "Farm Financial Policy", in : Peter J. Barry and Michael D. Boehlje (Eds.), *Financing the Agricultural Sector*, Westview Press, Boulder, pp. 129-130.
- Bathrick, D. David (1981), *Agricultural Credit for Small Farm Development : Policies and Practices*, Westview Press, Boulder, 170 p.
- Bedbak, Hrushikesh (1985), "Cost of Institutional Finance in Priority Sectors - Reduction of Credit Acquisition Cost is Vital (An Empirical Study)", *Indian Cooperative Review*, 22 (3) : 263-264.
- Besley, Timothy (1994), "How Do Market Failures Justify Interventions in Rural Credit Markets ?", *The World Bank Research Observer*, 9 (1) : 27-47.
- Bhalerao, M.M. and Viswanath (1971), "Cooperative Finance - An Inter-State Comparison at the Village Level", *Indian Journal of Agricultural Economics*, 26 (4) : 583-584.
- Bhatt, V.V. and Allen R. Roe (1979), *Capital Market Imperfections and Economic Development*, The World Bank Staff Working Paper No. 338, The World Bank, Washington, D.C., 87 p.
- Bourne, Compton and Douglas H. Graham (1983). "Economic Disequilibria and Rural Financial Market Performance in Developing Economies". *Canadian Journal of Agricultural Economics*, 31 (1) : 59-76.
- Chadha, G.K. (1978), "Farm Size and Productivity Revisited : Some Notes from Recent Experience of Punjab", *Economic and Political Weekly*, 13 (39) : A87-A96.

- Chand, Ramesh and D.S. Sidhu (1985), "Characteristics of Defaulters of Agricultural Credit in Punjab - A Discriminant Function Approach", *Indian Cooperative Review*, 22 (3) : 251-262.
- Chand, Ramesh (1992), "Agricultural Credit in India : Distributional Disparities and Overdues", *Agricultural Economics Research Review*, 5 (2) : 176-192.
- Chow, C. Gregory (1985). *Econometrics*, Mc Graw-Hill International Student Edition, Singapore, pp 253-257.
- CMIE (1993), *Profiles of Districts*, Economic Intelligence Service, Mumbai, pp. 190.
- CMIE (1996), *India's Agricultural Sector : A Compendium of Statistics*, Economic Intelligence Service, Mumbai, pp. 1-4.
- Dadhich, C.L. (1971a), "Socio-Economic Factors Influencing Repayment of Cooperative Dues in Rajasthan (A Case Study)", *Indian Journal of Agricultural Economics*, 26 (4) : 585.
- Dadhich, C.L. (1971b), "Wilful Default of Cooperative Credit in Rajasthan - Some Issues", *Indian Journal of Agricultural Economics*, 26 (4) : 585-586.
- Dadibhavi, R.V. (1988), "Dimensions of Regional Disparities in Institutional Credit to Agriculture", *Indian Journal of Agricultural Economics*, 43 (3) : 374-380.
- Dandekar, V.M. (1993), "Limits of Credit, Not Credit Limits", *Economic and Political Weekly*, 28 (39) : A86-A95.
- Demaris, Alfred (1992). *Logit Modelling : Practical Applications*, Sage University Press, California, 87 p.
- Desai, B.M. and D.K. Desai (1971). *Farm Production Credit in Changing Agriculture*, Centre for Management in Agriculture, Indian Institute of Management, Ahmedabad, 104 p.
- Desai, D.K. (1988). "Institutional Credit Requirements for Agricultural Production - 2000 A.D.". *Indian Journal of Agricultural Economics*, 43 (3) : 326-355.

- Desai, D. Mahendra and Bharat D. Naik (1971), "Prospects of Demand for Short-Term Institutional Credit for High-Yielding Varieties", *Indian Journal of Agricultural Economics*, 26 (4) : 458-467.
- Desai, B.M., V.K. Gupta and Gurudev Singh (1988), "Institutional Credit for Green Revolution Areas Under Semi-Arid Tropics in India", *Indian Journal of Agricultural Economics*, 43 (1) : 1-13.
- Desai, B.M. and N.V. Namboodiri (1991), *Institutional Finance for Agriculture*, CMA Monograph 151, Oxford & IBH Publishing Co., New Delhi, 100 p.
- Desai, M. Bhupat (1994a), "Contributions of Institutional Credit, Self-Finance and Technological Change to Agricultural Growth in India", *Indian Journal of Agricultural Economics*, 49 (3) : 457-475.
- Desai, M. Bhupat (1994b), "Scale and Scope Economies in Rural Banking : Their Implications for Rural Credit Policies", in : Mruthyunjaya, V.C. Mathur and Praduman Kumar (Eds.), *Agricultural Credit System in India : The Next Stage*, Agricultural Economics Research Association (India), New Delhi, pp. 27-59.
- Dhayani, B.L. and S.K. Tewari (1988), "Predicting Good and Bad Risks in Agricultural Production Credit : An Application of Numerical Evaluation System", *Indian Journal of Agricultural Economics*, 43 (2) : 126-138.
- Dhawan, K.C. and A.S. Kahlon (1978), "Adequacy and Productivity of Credit on the Small Farms in the Punjab", *Indian Journal of Agricultural Economics*, 33 (4) : 91-99.
- Dillon, L. John and Jock, R. Anderson (1990), *The Analysis of Responses in Crop and Livestock Production*, Pergamon Press, Oxford, 251 p.
- Doll, P. John (1974), "On Exact Multicollinearity and the Estimation of the Cobb-Douglas Production Function", *American Journal of Agricultural Economics*, 56 (3) : 556-563.
- Dunn, J. Daniel and Thomas L. Frey (1976), "Discriminant Analysis of Loans for Cash-Grain Farms", *Agricultural Finance Review*, 36 : 60-66.

- Feder, Gershon, Tongroj Onchan and Tejaswi Raparla (1988). "Collateral, Guarantees and Rural Credit in Developing countries : Evidence from Asia", *Agricultural Economics*, 2 (3) : 231-245.
- Feder, Gershon, Lawrence J. Lau, Justin Y. Lin and Xiaopeng Luo (1990), "The Relationship Between Credit and Productivity in Chinese Agriculture : A Microeconomic Model of Disequilibrium", *American Journal of Agricultural Economics*, 72 (5) : 1151-1157.
- Fernandes, E.C.M. and P.K.R. Nair (1986), "An Evaluation of the Structure and Function of Tropical Homegardens", *Agricultural Systems*, 21 (4) : 279-310.
- Gadgil, M.V. (1986), "Agricultural Credit in India : A Review of Performance and Policies", *Indian Journal of Agricultural Economics*, 41 (3) : 282-309.
- Gadgil, M.V. (1994), "Formal Agricultural Credit System in India : Shape of Things to Come", *Indian Journal of Agricultural Economics*, 49 (3) : 476-490.
- Gangadharan, T.P. (1994), "Rural Credit Needs : Perspectives", in : Mruthyunjaya, V.C. Mathur and Praduman Kumar (Eds.), *Agricultural Credit System in India : The Next Stage*, Agricultural Research Association (India), New Delhi, pp. 107-117.
- Gasson, Ruth (1967). "Some Economic Characteristics of Part-Time Farming in Britain". *Journal of Agricultural Economics*, 18 (1) : 111-120.
- George, K.M. and K. Sathees Babu (1996), "Overdue Patterns of PACS : A Micro Level Analysis", *Agricultural Banker*, 20 (1) : 29-37.
- George, M.V. and P.T. Joseph (1976). "Changes in the Structure of Land Ownership and Use in Kerala and their Economic Implications". *Indian Journal of Agricultural Economics*, 32 (2) : 27-31.
- Government of India (1972), *Report of the Banking Commission* (Chairman : R.G. Saraiya), Manager of Publications, Delhi, 760 p.

- Government of India (1976), *Report of the National Commission on Agriculture*, Part XII - Supporting Services and Incentives (Chairman : N.R. Mirdha), Ministry of Agriculture and Irrigation, New Delhi, 229 p.
- Government of India (1995), *Economic Survey 1994-95*, Ministry of Finance, Economic Division, New Delhi, pp. 156-158.
- Government of India (1997a), *Economic Survey 1996-97*, Ministry of Finance, Economic Division, New Delhi, pp. 184-186.
- Government of India (1997b), *Agricultural Wages in India (1993-94)*, Directorate of Economics & Statistics, Ministry of Agriculture, pp. 2.
- Government of Kerala (1994), *Farm Guide - 1994*, Farm Information Bureau, Thiruvananthapuram, pp. 3.
- Government of Kerala (1996), *Economic Review 1995*, State Planning Board, Thiruvananthapuram, 196 p.
- Government of Kerala (1998a), *Economic Review 1997*, State Planning Board, Thiruvananthapuram, 161 p.
- Government of Kerala (1998b), *Farm Guide - 1998*, Farm Information Bureau, Thiruvananthapuram, pp. 3-32.
- Goyal, S.K. and R.N. Pandey (1987), "An Analysis of Factors Affecting Overdues of Primary Agricultural Cooperative Credit and Service Societies in Haryana", *Indian Cooperative Review*, 25 (1) : 50-54.
- Gujarati, N. Damodar (1995), *Basic Econometrics*, Mc Graw - Hill International Edition, Singapore, pp 319-346.
- Gupta, R.P. and S.K. Tewari (1985). "Factors Affecting Crop Diversification : An Empirical Analysis ". *Indian Journal of Agricultural Economics*, 40 (3) : 304-305.
- Haque, T. (1985). "Regional Trends and Patterns of Diversification of the Rural Economy in India". *Indian Journal of Agricultural Economics*, 40 (3) : 291-297.

- Haque, T. and Sunita Verma (1988). "Regional and Class Disparities in the Flow of Agricultural Credit in India". *Indian Journal of Agricultural Economics*, 43 (3) : 356-363.
- Haque, T. (1996). "Diversification of Small Farms in India : Problems and Prospects". In : T. Haque (Ed.). *Small Farm Diversification : Problems and Prospects*, Workshop Proceedings 1, National Centre for Agricultural Economics and Policy Research, New Delhi, pp 13-36.
- Hazell, B.R. Peter (1992). "The Appropriate Role of Agricultural Insurance in Developing Countries". *Journal of International Development*, 4 (6) : 567-581.
- Heady, O. Earl and John, L. Dillon (1988), *Agricultural Production Functions*, Kalyani Publishers, Ludhiana, 667 p.
- Hoff, Karla and Joseph E. Stiglitz (1990), "Imperfect Information and Rural Credit Markets - Puzzles and Policy Perspectives", *The World Bank Economic Review*, 4 (3) : 235-250.
- Jayaraman, T.K. (1978), "An Analysis of Overdues of Primary Agricultural Cooperative Societies : A Case Study of Mani-Kadana Project in Gujarat State", *Indian Journal of Agricultural Economics*, 33 (3) : 21-28.
- Johnson, T. David (1990). *The Business of Farming : A Guide to Farm Business Management in the Tropics*, ELBS with Macmillan, London, pp 43-48.
- Kahlon, A.S. and Karam Singh (1991). *New Directions in Agricultural Credit System and Rural Financial Markets*, Allied Publishers, New Delhi, 250 P.
- Kahlon, A.S. (1991), "Institutional Credit and Overdues : Borrowers' Angle", *Economic and Political Weekly*, 26 (5) : 243-246.
- Kalyankar, S.P. and K.D. Rajmane (1987), "Discriminant Function Analysis in the Loans of Cooperatives", *Indian Cooperative Review*, 25 (1) : 38-42.
- Kannan, K.P. (1990), "Kerala Economy at the Crossroads ?," *Economic and Political Weekly*, 25 (35 & 36) : 1951-1956.

- Kapoor, Sanjay (1994). "Demand and Supply Analysis of Institutional Credit in Indian Agriculture : An Econometric Approach". In : Mruthyunjaya, V.C. Mathur and Praduman Kumar (Eds.). *Agricultural Credit System in India : The Next Stage*, Agricultural Economics Research Association (India), New Delhi, pp 119-138.
- Kerala Agricultural University (1989). *Package Practices, Recommendations, 1989*. Directorate of Extension, Mannuthy, Trichur, 253 p.
- Kerala Agricultural University (1989), *National Agricultural Research Project : Status Report of the Southern Zone (Vol. I)*, N. Mohanakumaran and R. Balakrishnan Asan (Eds.), Vellanikkara, pp. 1-14.
- Khatkar, R.K., R.C. Hasija and Pradeep Kumar (1994), "Trend of Agricultural Credit and Overdues in Haryana", *Agricultural Banker*, 18 (2) : 27-28.
- Klein, R. Lawrence (1962), *An Introduction to Econometrics*, Prentice-Hall, Englewood Cliffs, N.J., pp 64 and 101.
- Koutsoyiannis, A. (1977), *Theory of Econometrics : An Introductory Exposition of Econometric Methods*, ELBS with Macmillan, Hampshire, pp 233-256.
- Krause, R. Kenneth and Paul L. Williams (1971), "Personality Characteristics and Successful Use of Credit by Farm Families", *American Journal of Agricultural Economics*, 53 (4) : 619-624.
- Krause, M.A., R.R. Deuson, T.G. Baker, P.V. Preckel, J. Lowenberg- De Boer, K.C. Reddy and K. Maliki (1990), "Risk Sharing Versus Low Cost Credit Systems for International Development", *American Journal of Agricultural Economics*, 72 (4) : 911-922.
- Krishnan, C. (1990), "Regional Rural Banks and Recovery of Agricultural Credit", *Agricultural Banker*, 15 (2) : 27-29.
- Kumar, Praduman, P.K. Joshi and M.A. Muraleedharan (1978), "Estimation of Demand for Credit on Marginal Farms - A Profit Function Approach", *Indian Journal of Agricultural Economics*, 33 (4) : 106-114.



- Kumar, S. Hari (1991a), "Utilisation and Repayment of Agricultural Loans of Regional Rural Banks : A Case Study", *Agricultural Banker*, 15 (3) : 13-17.
- Kumar, S. Hari (1991b). "Informal Leasing in Kerala : A Study of Kuttanad". *Indian Journal of Agricultural Economics*, 46 (3) : 369-373.
- Kurup, N.P. (1996), "Banking Sector Reforms and Transparency", *Economic and Political Weekly*, 31 (12) : 745-747.
- Ladman, R. Jerry and Ronald L. Tinnermeier (1981), "The Political Economy of Agricultural Credit : The Case of Bolivia", *American Journal of Agricultural Economics*, 63 (1) : 66-72.
- La Due, L. Eddy (1990), "Moral Hazard in Federal Farm Lending", *American Journal of Agricultural Economics*, 72 (3) : 774-779.
- Leathers, D. Howard and Jean-Paul Chavas (1986), "Farm Debt, Default, and Foreclosure : An Economic Rationale for Policy Action", *American Journal of Agricultural Economics*, 68 (4) : 828-837.
- Lee, F. Warren, Michael D. Boehlje, Aaron G. Nelson and William G. Murray (1988). *Agricultural Finance*, Kalyani Publishers, Ludhiana, pp 98.
- Maddala, G.S. (1986). *Limited-dependent and Qualitative Variables in Econometrics*, Cambridge University Press, Cambridge, pp 22-27.
- Mehta, R.C. and D.S. Sidhu (1971), "A Study of Impact of Medium and Long-Term Loans on Short-Term Credit Needs of the Punjab Farmers", *Indian Journal of Agricultural Economics*, 26 (4) : 489-495.
- Mohan, T.C., T. Veerasamy and S. Sivaraman (1985), "Bayesian Analysis of Crop Loan Overdues in Cooperative Societies in Thanjavur District, Tamil Nadu : A Note", *Indian Journal of Agricultural Economics*, 40 (4) : 549-555.

- Ninez, V. (1987), "Household Gardens : Theoretical and Policy Considerations", *Agricultural Systems*, 23 (3) : 167-186.
- Oberoi, R.C., A.K. Sharma and T.V. Moorti (1991), "Estimation of Credit Needs and Employment Generation on Tribal Farms of Himachal Pradesh", *Agricultural Situation in India*, 46 (9) : 641-644.
- Pandey, U.K. and M.A. Muraleedharan (1977), "An Application of Discriminant Function in Agricultural Finance", *Indian Journal of Agricultural Economics*, 32 (2) : 41-51.
- Pandey, R.K. and Ashok Kumar (1988), "Study of Growth and Disparity in the Flow of Cooperative Credit in India", *Indian Journal of Agricultural Economics*, 43 (3) : 416.
- Parmar, Thakarsinh and A.R. Patel (1994), "Recovery of Priority Sector Advances by Commercial Banks", *Agricultural Banker*, 17 (1) : 1-5.
- Patil, H.K. and R.P. Singh (1991), "Modern Technology and Credit Requirements : A Case Study of Tribal Farms of Thane District in Maharashtra", *Agricultural Economics Research Review*, 4 (1) : 14-24.
- Patric, F. George and Ludwig M. Eisgruber (1968). "The Impact of Managerial Ability and Capital Structure on Growth of the Farm Firm". *American Journal of Agricultural Economics*. 50 (3) : 491-506.
- Penny, D.H. (1968), "Farm Credit Policy in the Early Stages of Agricultural Development", *The Australian Journal of Agricultural Economics*, 12 (1) : 32-45.
- Pingali, L. Prabhu (1997). "From Subsistence to Commercial Production Systems : The Transformation of Asian Agriculture". *American Journal of Agricultural Economics*, 79 (2) : 628-634.
- Planning Commission (1985), *Seventh Five Year Plan, 1985-90*, Vol. II (Sectoral Programmes of Development), pp. 17.

- Pollard, K. Stephen and Harpal S. Grewal (1983). "Simulating the Impacts of Credit Policy and Fertilizer Subsidy on Central Luzon Rice Farms, the Philippines : Comment ". *American Journal of Agricultural Economics*, 65 (2) : 349-350.
- Prasad, Y. Eswara and Lalith Achoth (1992), "Credit Screening : Application of Discriminant Analysis to Identify Potential Defaulters of IRDP Assistance in Anantpur District, A.P.", *Indian Cooperative Review*, 30 (2) : 110-117.
- Raj, K.N. (1975). "Agricultural Development and Distribution of Land Holdings". *Indian Journal of Agricultural Economics*, 30 (1) : 1-13.
- Rajagopalan, V. (1968), "Farm Liquidity and Institutional Financing for Agricultural Development", *Indian Journal of Agricultural Economics*, 23 (4) : 25-30.
- Rajasekhar, D. and G. Suvarchala (1991), "Institutional Credit and Overdues", *Economic and Political Weekly*, 26 (30) : 1819-1820.
- Rajasekhar, D. and Vinod Vyasulu (1991), "Half-Life of Credit : Simulating Fund Flows in Priority Sector", *Economic and Political Weekly*, 26 (39) : A135-A143.
- Ramesha, K. (1990), "An Assessment of the Production Credit Gap on Paddy Farms", *Agricultural Banker*, 13 (1) : 29-39.
- Rao, P. Punna and Ch. Satyanarayana (1992), "Profitability of Crop Loans Under Regional Rural Banks", *Agricultural Banker*, 17 (1) : 44-46.
- Rao, T.S. (1962), *Guide to Methods and Procedures of Rural Credit Surveys*, FAO Agricultural Development Paper No. 73, Food and Agriculture Organization of the United Nations, Rome, 106 p.
- Reddy, T. Prabhakar (1990), "Agricultural Credit : A Study", *Yojana*, 34 (17) : 27-29.
- Registrar General and Census Commissioner (1991a), *Census of India 1991, Series I (Final Population Totals)*, Ministry of Home Affairs, New Delhi, 615 p.

- Registrar General and Census Commissioner (1991b), *Census of India 1991, Series I, Part II-B, Vol. I (General Population)*, Ministry of Home Affairs, New Delhi, 963 p.
- Reserve Bank of India (1954), *All India Rural Credit Survey - Report of the Committee of Direction (Chairman : A.D. Gorwala)*, Vol. II (The General Report), Bombay, pp. 238.
- Reserve Bank of India (1969a), *Report of the All India Rural Credit Review Committee (Chairman : B. Venkatappiah)*, Bombay, pp. 483-484.
- Reserve Bank of India (1969b), "Methods and Mechanics of Lending to Agriculture", in : V.G. Pendharkar, V.M. Jakhade and A.Raman (Eds.), *Financing of Agriculture by Commercial Banks - Report of a Seminar held at Bombay on December 6 to 8, 1968*, Department of Banking Operations and Development, Bombay, pp. 142-146.
- Reserve Bank of India (1972), *Manual on Production-Oriented System of Lending for Agriculture*, Agricultural Credit Department, Bombay, 94 p.
- Reserve Bank of India (1974), *Report of the Study Team on Overdues of Cooperative Credit Institutions (Chairman : C.D. Datey)*, Agricultural Credit Department, Bombay, pp. 25-71.
- Reserve Bank of India (1977), *Committee on Integration of Cooperative Credit Institutions*, Agricultural Refinance and Development Corporation, Bombay, 621 p.
- Reserve Bank of India (1981), *Report of the Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development (CRAFICARD) (Chairman : B. Sivaraman)*, Rural Planning and Credit Cell, Bombay, 527 p.
- Reserve Bank of India (1989), *Report of the Agricultural Credit Review Committee : A Review of the Agricultural Credit System in India (Chairman : A.M. Khusro)*, Bombay, 1074 p.
- Reserve Bank of India (1990). *Report on Currency and Finance 1989-90. Vol. I (Economic Review)*. Department of Economic Analysis and Policy, Bombay pp 191-192.

- Sai, K.J.S. Satya (1988), "Flow of Institutional Credit to Agriculture in Deltaic Regions - A Case of West Godavari District, Andhra Pradesh", *Indian Journal of Agricultural Economics*, 43 (3) : 398-402.
- Salam, M. Abdul, K. Sathees Babu and N. Mohanakumaran (1995), "Homegarden Agriculture in Kerala Revisited", *Food and Nutrition Bulletin*, 16 (3) : 220-223.
- Sankhayan, P.L. (1988), *Introduction to the Economics of Agricultural Production*, Prentice-Hall of India, New Delhi, pp 36.
- Sathyanarayana, E. (1985), "Factors Influencing Credit Requirement of Farmers in a Backward Region", *Indian Cooperative Review*, 22 (3) : 326-332.
- Sharma, J.S. and B. Prasad (1971), "An Assessment of Production Credit Needs in Developing Agriculture", *Indian Journal of Agricultural Economics*, 26 (4) : 503-511.
- Sharma, N.K. (1985), "Central Cooperative Banks and Short-Term Agricultural Credit (A Case Study of Rajasthan)", *The Cooperator*, 22 (23) : 667-669.
- Shivmaggi, H.B. and Tara Shukla (1991), "Credit for Agricultural and Rural Development", in : M.L. Dantwala (Ed.), *Indian Agricultural Development Since Independence*, Oxford & IBH Publishing Co., New Delhi, pp. 243-276.
- Shollapur, M.R. (1997a), "Means to Ensure End-Use of Credit", *Indian Cooperative Review*, 34 (3) : 201-204.
- Shollapur, M.R. (1997b), "Analysis of Effectiveness of Credit Cycle : An Experience of the Primary Cooperative Credit Societies in Karnataka State", *Indian Cooperative Review*, 35 (1) : 30-48.
- Singh, A.J. and M.V. George (1968), "Role of Commercial Banks in Agricultural Finance - Competition or Co-existence with Cooperatives", *Indian Journal of Agricultural Economics*, 23 (4) : 8-15.
- Singh, L.R., J.P. Bhati and S.L. Jain (1971), "The Supply, Utilization and Economic Rationale of Credit Use on Progressive and Less Progressive Farms", *Indian Journal of Agricultural Economics*, 26 (4) : 474-479.

- Singh, U.S. and Dayanatha Jha (1971), "A Normative Analysis of the Impact of Capital Availability on Farm Income and Demand for Short-Term Credit on Farms in Delhi," *Indian Journal of Agricultural Economics*, 26 (4) : 524-532.
- Singh, Shiv Karan and R. Ramanna (1981), "The Role of Credit and Technology in Increasing Income and Employment on Small and Large Farms in Western Region of Hyderabad District, Andhra Pradesh", *Indian Journal of Agricultural Economics*, 36 (3) : 41-51.
- Singh, S.P., Balishter and A.K. Jain (1990), "An Analysis of Factors Affecting Overdues of Agricultural Loans - A Study in Agra District of Uttar Pradesh", *Indian Cooperative Review*, 27 (3) : 296-304.
- Singh, S.P. and Mruthyanjaya (1992), "Credit Utilization and Overdues on Marginal and Small Farms in Aligarh District of Uttar Pradesh", *Agricultural Banker*, 15 (2) : 27-31.
- Singh, G.N., R.K.S. Kushwaha and R.B. Singh (1994), "Agricultural Finance in the Context of Technology-Led Agricultural Development", *Indian Journal of Agricultural Economics*, 49 (3) : 508.
- Singh, R.P. and K. Sathees Babu (1996). "Performance and Prospects of Regional Rural Banks - An Appraisal". *Kurukshetra*, 44 (10) : 21-25.
- Singha, Kanhaiya (1991), "Rural Credit in India - A Perspective", *Kurukshetra*, 39 (10) : 4-9.
- State Bank of Travancore (1998). *Background Paper for Formulation of Credit Plan, 1998-99 Under Service Area Approach (Kottayam District)*, Zonal Office, Kottayam, 26 p.
- State Planning Board (1976), *High Yielding Varieties Programme in Kerala - An Evaluation Study*, Evaluation Series 24, Government of Kerala, Trivandrum, pp. 36-37.
- Stiglitz, Joseph and Andrew Weiss (1981). "Credit Rationing and Markets with Imperfect Information". *American Economic Review*, 71 (3) : 393-410.

- Subbarao, K. (1980), "Institutional Credit, Uncertainty and Adoption of HYV Technology : A Comparison of East U.P. with West U.P.", *Indian Journal of Agricultural Economics*, 35 (1) : 69-90.
- Subrahmanyam, K.V. (1975), "Adoption of New Technology on Small Farms : The Role of Credit and Its Requirements", *Indian Journal of Agricultural Economics*, 30 (3) : 181-185.
- Subramanian, S.R., K. Ramamoorthy and S. Varadarajan (1971), "Credit Needs and Availability to Farmers", *Indian Journal of Agricultural Economics*, 26 (4) : 558.
- Sundaram, I. Satya (1991), "The Problem of Overdues", *Indian Banking Today and Tomorrow*, 16 (7) : 15-17.
- Talwar, S.P. (1996), "Current Banking Scenario and the Need for Policy Change", *Reserve Bank of India Bulletin*, 50 (8) : 395-400.
- Tyagi, A.K. and U.K. Pandey (1982), "A Note on the Application of Profit Function in Agricultural Finance", *Indian Journal of Agricultural Economics*, 37 (2) : 191-198.
- Van Horne, C. James (1996). *Financial Management and Policy*, Prentice-Hall of India, New Delhi pp 455.
- Vogel, C. Robert (1981). "Rural Financial Market Performance : Implications of Low Delinquency Rates". *American Journal of Agricultural Economics*, 63 (1) : 58-65.
- Walker, S. Thomas and N.S. Jodha (1986). "How Small Farm Households Adapt to Risk". In : Peter Hazell, Carlos Pomareda and Alberto Valdes (Eds.). *Crop Insurance for Agricultural Development : Issues and Experience*, the International Food Policy Research Institute and the Johns Hopkins University Press, Baltimore, pp 17-34.
- World Bank (1975), *The Assault on World Poverty : Problems of Rural Development, Education and Health*, The Johns Hopkins University Press, Baltimore, 425p.
- Zeller, Manfred (1994). "Determinants of Credit Rationing : A Study of Informal Lenders and Formal Credit Groups in Madagascar". *World Development*, 22 (12) : 1895-1907.

## Appendix - I

### DISTRICT WISE DISBURSAL OF INSTITUTIONAL CREDIT TO AGRICULTURE IN KERALA

(Amount in Rs. lakhs)

District	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	Mean
Tiruvanathapuram	4525.95	838.57	2974.20	5109.82	4829.01	3783.57	5347.74	4427.22	6837.47	7717.54	9453.31	10786.76	5552.60
Kollam	2944.82	3924.81	3972.51	4020.21	3654.89	3202.57	4856.28	5224.01	6888.47	7516.11	5615.12	5332.68	4762.71
Alapuzha	2312.42	1973.04	2083.73	2194.42	2355.26	1385.05	2327.44	2542.30	3611.59	4727.70	5833.60	6939.49	3190.50
Pathanamthitta	1763.02	2085.83	2233.16	2380.48	2530.16	2413.24	2681.97	2006.66	2568.69	3173.05	3777.40	5332.68	2745.53
Kottayam	3937.10	4365.85	4247.70	4129.55	3995.17	6237.54	5912.26	5163.30	6468.77	8312.72	9979.83	12237.65	6251.95
Idukki	2280.32	2764.88	2816.63	2868.37	2839.34	2399.56	3530.87	3307.20	3956.29	4928.81	6571.97	7560.08	3818.28
Ernakulam	2965.17	2767.25	3305.71	3844.16	4226.86	4574.45	6214.37	5505.30	7513.18	9593.00	9851.15	13942.00	6191.85
Thrissur	4058.41	4627.39	4586.47	4545.54	4381.42	4150.41	4967.48	4509.80	5035.74	6076.54	9071.46	10077.51	5507.35
Palakkad	2981.82	1742.52	2124.95	3620.68	3585.17	3485.56	4098.01	4174.39	5596.16	6974.95	8366.19	10991.79	4811.85
Malappuram	3845.52	935.38	2557.45	4179.51	4059.63	4160.02	5669.21	4946.05	6595.27	7358.34	9329.53	10927.05	5380.25
Kozhikkode	1265.72	1382.68	2741.32	4589.11	4524.99	4281.26	4807.76	6251.71	6925.38	8795.48	7110.43	12628.54	5442.03
Wayanad	1740.50	3226.00	3275.13	3324.25	3145.41	2921.87	3864.34	4151.13	4611.87	5731.00	5968.29	8020.42	4165.02
Kannur	2681.35	3098.37	3009.99	2921.61	3386.74	2758.04	4974.46	5564.57	6398.56	8579.26	9654.63	12035.46	5421.92
Kasargode	2281.35	2593.12	2553.60	2514.08	2703.17	2444.51	3046.64	3630.11	4008.67	5067.54	5579.30	6402.64	3568.73



Appendix - II

NUMBER OF FARMERS WHO RANKED THE LIMITING FACTORS OF CROP LOAN RECEIPT  
AS THEIR FIRST CHOICE

Limiting Factors	Non-defaulters			Defaulters			Overall Mean
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
Rigid formalities	15.00 (68.18)	8.00 (44.44)	11.50 (57.50)	17.00 (65.38)	8.00 (53.33)	12.50 (60.98)	12.00 (14.81)
Preoccupation with paper works	3.00 (13.64)	4.00 (22.22)	3.50 (17.50)	3.00 (11.54)	3.00 (20.00)	3.00 (14.63)	3.25 (4.01)
Cumbersome procedures	3.00 (13.64)	1.00 (5.56)	2.00 (10.00)	5.00 (19.23)	4.00 (26.67)	4.50 (21.95)	3.25 (4.01)
Demand for gratification	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Others	1.00 (4.55)	5.00 (27.78)	3.00 (15.00)	1.00 (3.85)	0.00 (0.00)	0.50 (2.44)	1.75 (2.16)

Figures in parentheses indicate the percentage to the respective total.

Appendix - III

NUMBER OF FARMERS WHO RANKED THE IMPROVEMENT MEASURE  
AS THEIR FIRST CHOICE

Measures	Non-defaulters			Defaulters			Overall Mean
	Cooperatives	Commercial Banks	Average	Cooperatives	Commercial Banks	Average	
Adequacy of amount	16.00 (40.00)	22.00 (55.00)	19.00 (47.50)	5.00 (12.50)	20.00 (50.00)	12.50 (31.25)	15.75 (39.38)
Timeliness in supply	17.00 (42.50)	12.00 (30.00)	14.50 (36.25)	19.00 (47.50)	2.00 (5.00)	10.50 (26.25)	12.75 (31.88)
Low interest rate	2.00 (5.00)	1.00 (2.50)	1.50 (3.75)	8.00 (20.00)	2.00 (5.00)	5.00 (12.50)	3.25 (8.13)
Proper supervision and follow up	1.00 (2.50)	4.00 (10.00)	2.50 (6.25)	6.00 (15.00)	12.00 (30.00)	9.00 (22.50)	5.75 (14.38)
Insistence on cash and kind components	0.00 (0.00)	1.00 (2.50)	0.50 (1.25)	0.00 (0.00)	4.00 (10.00)	2.00 (5.00)	1.25 (3.13)
Others	4.00 (10.00)	0.00 (0.00)	2.00 (5.00)	2.00 (5.00)	0.00 (0.00)	1.00 (2.50)	1.50 (3.75)

Figures in parentheses indicate the percentage to the respective total.

Appendix - IV

**SURVEY ON INSTITUTIONAL CREDIT SUPPLY  
AND REPAYMENT BEHAVIOUR OF FARMERS  
IN KERALA : A POLICY PERSPECTIVE**

**SURVEY SCHEDULE**

**DIVISION OF AGRICULTURAL ECONOMICS,  
INDIAN AGRICULTURAL RESEARCH INSTITUTE,  
NEW DELHI - 110 012**

**SURVEY ON INSTITUTIONAL CREDIT SUPPLY AND  
REPAYMENT BEHAVIOUR OF FARMERS IN KERALA :  
A POLICY PERSPECTIVE**

**A. GENERAL INFORMATION**

1. District (001) .....
2. Agroclimatic Zone (002) .....
3. Village (003) .....
4. Name of the head of household (004) .....
5. Age (years) (005) .....
6. Educational Status (006)
 

01. Illiterate	03. Secondary
02. Primary	04. Graduation and above
7. Member of any organisations (007)
 

01. None	04. Co-operative society
02. Village Panchayat	05. Others (specify)
03. Zilla Parishad	
8. Primary occupation (008)
 

01. Agriculture	04. Industry
02. Business	05. Other (specify)
03. Service	
9. Is any of your family member work in Gulf Country? (009)
 

Yes (01)/ No (02)

If Yes, Annually remittance made (010)

Rs. ....

10. Additional Source of Income (011) Yes (01)/ No (02)  
 If Yes, the type (012)  
 01. Business                      02. Industry                      03. Leasing  
 04. Lending money    05. Others (Specify)
- Average monthly/annual income (013)  
 Rs. .... Month/Year
11. Family size :  
       Male (014) .....  
       Female (015) .....  
       Total (016) .....
12. Members working on the farm :  
 Male (01) ..... Female (02) ..... Total (03) .....  
 Adults (04) ..... Minor (less than 18 years) (05) .....
13. Experience of farming (014) .....Years
14. Formal or informal training in agriculture or related areas (015)  
Yes (01)/No (02)  
 If yes, organisation imparting training (016)  
 0.1 ICAR Institutes                      04. Financial Institutions  
 02. SAU                                      05. Department of Agriculture  
 03. NABARD                                06. Others (specify)
- Aspects (017)  
 01. Crop production                      03. Poultry management  
 02. Dairy management                      04. Any other aspect (specify)
- Duration (018)  
 01. Less than one month                      03. More than one month  
 02. One month

15. Other than head of the family have undergone training in agricultural production/finance (019)

Yes (01)/No (02)

16. Experience of borrowing funds for crop production (020) ..... Yrs.

17. Major sources of borrowing (021)

01. Institutional

02. Non-institutional

18. Any family member employed in financial institution (022)

Yes (01)/No (02)

If yes (023), employed in

commercial bank (01)/cooperative (02)/RRB (03)

**B. DETAILS ABOUT OPERATIONAL HOLDINGS (024)**

Particulars	Area in acres		Total
	Wetland	Garden land	
a) i) Owned			
ii) Leased in			
iii) Leased out			
iv) Net operational			
b) Irrigated (%)			
i) Canal			
ii) Well			
iii) Pond			
iv) Others (specify)			
v) Total net irrigated area			

Owner of well (025) : Yes (01)/No (02)

If yes, year of installation (026) : .....

Amount spent in installation (027) : .....

Source of finance (028)

01. Own

02. Borrowed

If borrowed, fraction of total cost (%) (029) : ..... %

### C. FARM ASSETS (030)

Particulars	Number	Year of purchase/ installation	Source of finance		Present value
			Owned	Borrowed	
i) Milch Animals					
a) Cow	Local breed Cross-breed				
b) Buffalo	Local Improved				
c) Goat	Local Improved				
d) Young stocks					
ii) Draught Animals					
iii) Poultry Birds	Local Improved				
iv) Pigs	Local Improved				
v) Farm machinery and Equipments					
a) Tractor					
b) Power Tiller					
c) Thresher					
d) Others (specify)					

Particulars	Number	Year of purchase installation	Source of finance		Present value
			Owned	Borrowed	
vi) Farm House					
a) Cattle shed					
b) Implement shed					
c) Seed/fertilizer store					
vii) Motor and pumpset					
viii) Bullock cart/ Tractor Trailer					
ix) Tubewell					
x) Minor tools					
a) Spade					
b) Pickaxe					
c) Khurpi					
d) Sickle					
e) Others (Specify)					



## D. LAND USE PATTERN (031)

Crops	Area in acres			
	Autumn	Winter	Summer	Total
1. Rice				
a) Local				
b) HYVs				
2. Vegetables				
a) Local				
b) HYVs				
3. Pulses				
a) Green gram				
b) Black gram				
c) Horse gram				
d) Others (specify)				
4. Oil seeds				
a) Groundnut				
b) Seasmum				
c) Others (specify)				
Annual Crops				
1. Banana (Nendran)				
2. Banana (Plantain)				
3. Tapioca				
4. Pine apple				
5. Ginger				
6. Turmeric				
7. Minor tubers				
a) Colocasia				
b) Yam				
c) Dioscorea				
d) Sweet Potato				
e) Others (specify)				
8. Other annuals (specify)				

Perennial crops	Number of plants		
	Non-bearing	Bearing	Total
1. Coconut			
2. Arecanut			
3. Rubber			
4. Cashew			
5. Pepper			
6. Jack			
7. Mango			
8. Papaya			
9. Other tree spices			
a) Clove			
b) Cinnamon			
c) Nutmeg			
d) Others (specify)			
10. Other crops (specify)			

**E. DETAILS OF INSTITUTIONAL BORROWING FOR CROP PRODUCTION (032) (1996-97)**

Crop	Amount	Cash Component	Kind Component	Duration of Loan



5. Time taken in obtaining the loan from the date of your application ..... days/month (037)
6. Has any of your activity affected by the delay (038)

Yes (01)/No (02)

which activity and if yes, the extent of losses in output (039)

Activities	Extent of economic loss (in terms of expected loss in output (%))
Land preparation	
Procurement of seeds	
Procurement of soil amendments	
Procurement of FYM	
Procurement of Fertilizers	
Procurement of Herbicides	
Procurement of PP chemicals	
Hiring labour	
Hiring animal power	
Hiring mechanical power	
Procurement of diesel	
Intercultural operations like weeding	
Harvesting	
Any others (specify)	

7. Procedure for charging the interest (040)

01 From the date of sanction of loan

02 From the date of disbursement of loan

03 Flat rate

04 On outstanding balance

8. Was the loan disbursed in more than one instalment (041)

Yes (01)/No (02)

If yes, the details (042)

No.	Crop stage	Amount

9. Are you aware that the loan is sanctioned for different operations in crop production (042)

Yes (01)/No (02)

10. Was the Sanctioned loan adequate (043)

Yes (01)/No (02)

If no, how the inadequacy was managed (044)

01 By borrowing from other sources

02 By using cheap and inferior quality inputs

03 By leasing out a portion of land

04 By leaving some land fallow

05 By reducing normal family consumption expenses

06 Others (specify)

11. The expected loss in yield/income on account of inadequacy in borrowed fund (045)

01. 5%

04. 15-25%

02. 5-10%

05. 25-30%

03. 10-15%

06. More than 50%

12. Was credit utilised for the purpose other than specified (046)

Yes (01)/No (02)

If yes, give details (047)

Purpose	% of total borrowed fund	Reason for diversion*
Specified purpose		
Food/clothing		
Medical expenses		
Educational expenses		
Repair/maintenance of house		
Social ceremony		
Any others (Specify)		

\* 01 Due to delay in disbursement, 02 Due to liquidity crunch and 03 Any other (specify)

13. Are you a recipient of credit other than crop production too (048)

Yes (01)/No (02)

If Yes, the details (049)

Purpose	Amount	Source of credit	Rate of interest	Loan maturity period	Repayments already made	Instalment of Repayment	Amount out standing

14. Security offered for the above loan (050)

01 DPN

02 Hypothecation

03 Collateral security (specify the type)

15. Security offered for the crop loan (051)

01 DPN

02 Hypothecation

03 Collateral security (specify the type)

## 16. Cost incurred in loan transaction (052)

Item	Amount	Expected Annual loss
01 Interest cost		
02 Share capital purchase		
03 Starting SB account		
04 Minimum balance		
05 Cost of inspection		
06 Cost of photographs		
07 Cost of documents		
08 Legal costs (if any)		
09 Cost of gratification (if any)		

17. Number of visits made to the institution (053) ..... No.  
 Cost incurred on travel/visit (054) Rs. ....  
 Cost on loss of time/visit (055) Rs. ....  
 Other expenses associated with the visit (056) Rs. ....

## F. REPAYMENT PATTERN OF THE LOAN (057)

Total sanctioned amount	Total interest accrued	Total dues paid on due date*	Amount overdue as on date	Reasons for default**

\* Yes (01) No (02)



\*\* Reasons for default (058)

- 01 Inadequacy of loan caused losses in anticipated income
- 02 Untimely disbursal caused losses in anticipated income
- 03 Fear of non-renewal
- 04 Crop failure
- 05 Low income due to price fall
- 06 Lack of supervision by bank officials
- 07 Anticipation of writing-off the loan
- 08 Loan utilised for non-productive purposes
- 09 Others (specify)

Rank	Item
I	
II	
III	
IV	
V	
VI	
VII	
VIII	
IX	

2. Have you ever been a defaulter in repaying the crop loan in the past (059)

Yes (01)/No (02)

If yes, how frequent (060)

01. Every year
02. Alternate year
04. Rarely

3. Was there any social function in the family during the recent past (061)

Yes (01)/No (02)

If Yes, the details (062)

Name of occurrence	Time of occurrence
01 Marriage of female members	
02 Marriage of male members	
03 Birth in the family	
04 Death in the family	
05 Others (specify)	

4. Have you received any notice from the lender reminding the payment due (063)

Yes (01)/ No (02)

If yes, nature of reminder (064)

- 01. Oral
- 02. written
- 03. Any other form (specify)

5. Are you aware that non-repayment can lead to legal recovery measures (065)

Yes (01)/No (02)

If Yes, reasons for non-compliance (066)

- 01 Connivance with the officials of the institution
- 02 Connivance with the revenue officials
- 03 Political patronage
- 04 Others (specify)

Rank	Item
I	
II	
III	
IV	

6. Is there any instance of your loan being renewed on account of non-payment on due date (067)

Yes (01)/No (02)

7. Is there any interest subsidy on loan if repayment is made on due date (068)

Yes (01)/No (02)

8. What measures in your opinion can improve the recovery performance (069)

Rank	Item
I	
II	
III	
IV	
V	
VI	

a) Adequacy of amount

b) Timeliness

c) Low rate of interest

d) Proper supervision and follow up

e) Insistence on cash and kind components

f) Others (specify)

9. What kind of problems do you face while dealing with financial institutions (070)

Rank	Item
I	
II	
III	
IV	
V	

01 Too many formalities

02 Preoccupation with many paper works

03 Demand for gratification

04 Rigid procedures

05 Others (specify)

10. In case of non-institutional borrowing what rate of interest you paid (071)
11. Do you face problems other than high rate of interest when you borrow funds from moneylenders (072)

- 01 Insistence on sale of output through him
- 02 Instence on forced labour
- 03 Insistence on procurement of inputs through him
- 04 Insistence on procurement of home requisites through him
- 05 Others (specify)

Rank	Item
I	
II	
III	
IV	
V	

**G. COST AND RETURNS FROM VARIOUS CROP ENTERPRISES (073)**

Crop grown :

Variety adopted : TV/HYV

Area :

Irrigation : Pond/Well/Canal/others (specify)

Operations	Human labour days			Bullock pair day			Machinery			Material costs		
	Family	Hired	Wage rate	Owned	Hired	Hiring charges	Owned	Hired	Hiring charges	Item	Qty	Price/unit
Land Preparation										Seed		
Soil amendment appl.										FYM		
FYM application										Fertilizer		
Sowing/transplanting										N		
Fertilizer application										P		
(a) basal										K		
(b) Top dressing										Herbicides		
Irrigation										PP chemicals		
1)										Soil amendments		
2)										Others		
3)										(Specify)		
Intercultural operations												
1)												
2)												
Harvesting												
Threshing												

Main product :

Qty. (kg)

Farm Harvest Price :

(Rs.)

Bye-product :

### G. COST AND RETURNS FROM VARIOUS CROP ENTERPRISES (074)

Crop grown :

Variety adopted : TV/HYV

Area :

Irrigation : Pond/Well/Canal/others (specify)

Operations	Human labour days			Bullock pair day			Machinery			Material costs		
	Family	Hired	Wage rate	Owned	Hired	Hiring charges	Owned	Hired	Hiring charges	Item	Qty	Price/unit
Land Preparation										Seed		
Soil amendment appl.										FYM		
FYM application										Fertilizer		
Sowing/transplanting										N		
Fertilizer application										P		
(a) basal										K		
(b) Top dressing										Herbicides		
Irrigation										PP chemicals		
1)										Soil amendments		
2)										Others		
3)										(Specify)		
Intercultural operations												
1)												
2)												
Harvesting												
Threshing												

Main product :

Qty. (kg)

Farm Harvest Price :

(Rs.)

Bye-product :

### G. COST AND RETURNS FROM VARIOUS CROP ENTERPRISES (075)

Crop grown :

Variety adopted : TV/HYV

Area :

Irrigation : Pond/Well/Canal/others (specify)

Operations	Human labour days			Bullock pair day			Machinery			Material costs		
	Family	Hired	Wage rate	Owned	Hired	Hiring charges	Owned	Hired	Hiring charges	Item	Qty	Price/unit
Land Preparation										Seed		
Soil amendment appl.										FYM		
FYM application										Fertilizer		
Sowing/transplanting										N		
Fertilizer application										P		
(a) basal										K		
(b) Top dressing										Herbicides		
Irrigation										PP chemicals		
1)										Soil		
2)										amendments		
3)										Others		
Intercultural operations										(Specify)		
1)												
2)												
Harvesting												
Threshing												

Main product :

Qty. (kg)

Farm Harvest Price :

(Rs.)

Bye-product :

**G. COST AND RETURNS FROM VARIOUS CROP ENTERPRISES (076)**

Crop grown :

Variety adopted : TV/HYV

Area :

Irrigation : Pond/Well/Canal/others (specify)

Operations	Human labour days			Bullock pair day			Machinery			Material costs		
	Family	Hired	Wage rate	Owned	Hired	Hiring charges	Owned	Hired	Hiring charges	Item	Qty	Price/unit
Land Preparation										Seed		
Soil amendment appl.										FYM		
FYM application										Fertilizer		
Sowing/transplanting										N		
Fertilizer application										P		
(a) basal										K		
(b) Top dressing										Herbicides		
Irrigation										PP chemicals		
1)										Soil amendments		
2)										Others		
3)										(Specify)		
Intercultural operations												
1)												
2)												
Harvesting												
Threshing												

Main product :

Qty. (kg)

Farm Harvest Price :

(Rs.)

Bye-product :





### G. COST AND RETURNS FROM VARIOUS CROP ENTERPRISES (077)

Crop grown :

Variety adopted : TV/HYV

Area :

Irrigation : Pond/Well/Canal/others (specify)

Operations	Human labour days			Bullock pair day			Machinery			Material costs		
	Family	Hired	Wage rate	Owned	Hired	Hiring charges	Owned	Hired	Hiring charges	Item	Qty	Price/unit
Land Preparation										Seed		
Soil amendment appl.										FYM		
FYM application										Fertilizer		
Sowing/transplanting										N		
Fertilizer application										P		
(a) basal										K		
(b) Top dressing										Herbicides		
Irrigation										PP chemicals		
1)										Soil amendments		
2)										Others		
3)										(Specify)		
Intercultural operations												
1)												
2)												
Harvesting												
Threshing												

Main product :

Qty. (kg)

Farm Harvest Price :

(Rs.)

Bye-product :

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