CHAPTER II

REVIEW OF LITERATURE AND METHODOLOGY

2.1 REVIEW OF RELEVANT LITERATURE

Various studies have already been made relating to agricultural credit. Some of the more important among the available studies in this regard have been critically reviewed in the following pages.

Herrick\(^1\) considered credit as that form of confidence reposed in a person to enable him to obtain another the temporary use of a thing of value.

According to Nicholson\(^2\), the main purpose for which an agriculturist needed money was to pay for current cultivation expenses and for family expenses. The agricultural credit was not only essential but was also inevitable for the farmers and as such it should be considered neither as objectionable nor as a sign of weakness.

Studies conducted by C. Clerk\(^3\) indicated that there was a positive correlation between the credit requirements and the improved techniques.

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\(^1\)J. Herrick, *Rural Credit*, Asia Publishing House, Bombay, 1953, pp.3-10.


Meclichar Emmanuel⁴ had argued that credit involved a temporary transfer of wealth and included the amounts provided by way of loans or advances, cash credit of advances, overdrafts or purchase of discount bills other than advances against security or by way of purchase of demand documentary bills, drawn in connection with the movement of a commodity.

Bedi and Saxena⁵ had found that the inadequate and untimely provision of credit had influenced adversely the responses of the Punjab farmers towards improved agricultural practices.

S.S. Joel and B.P. Singh⁶ had found that in Punjab, the government and the co-operative institutions were not meeting the full requirements of the development finance required by the farms.

Chowdhery⁷ had discovered that the credit requirements of the farmers were of different types and were for different purposes. For example the seasonal credit needs were for meeting the various current input requirements such as for

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the purchase of seeds, fertilizers and pesticides; medium term credit requirements were for the purchase of seeds, drills, sprayers and the like and long term credit needs were for purchases such as leveling of land for the construction of cattle sheds and the like.

Rajagopalan\(^8\) had defined agricultural credit as the amount of investment funds that could be made available for farm production from sources outside that of the farm. He had also defined agricultural credit as the amount of investment funds that could be made available for the purpose of development and sustenance of farm production and productivity.

Bhagava and Shah\(^9\) had pointed out that the credit needs of the farmers consisted of the purchase of credit for fertilizers, for hired labour, for pumpset, for land reclamation, for machinery and for agricultural equipments. The adoption of new technology was capital intensive in nature which would lead to a manifold increase in the credit demanded.

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Banker and Holcomb\textsuperscript{10} had believed that a farm in its operations would generate, besides income and assets, credit also and they had defined credit as the capacity to borrow or the ability to sell debt and thereby reap a rich dividend.

Based on the experience of the U.S.A. and other developed countries, Pattle\textsuperscript{11} had argued, that where capital markets were not well – developed, the government must provide, at least in the initial years, most of the money required for the agricultural credit systems.

Desai and Tambad\textsuperscript{12} had indicated that a high proportion of the farmers were eager to obtain credit at low rates of interest as also with an extended payment period.

Srivastava et al.,\textsuperscript{13} had recommended that as far as possible credit should be advanced in kind, and the small and the medium farmers should be brought under the scheme of supervised credit.


Singh and Misra\textsuperscript{14} had reported that the cultivators took loans from the different institutions, mainly for their irrigational structuring for the repayment of old debts, and for the purchase of manures, fertilizers and seeds.

According to J.S. Sharma and B. Prasad,\textsuperscript{15} credit, in addition to savings, was an important source for meeting the increasing capital needs of agriculture.

Alhavale et.al.,\textsuperscript{16} reported that the co-operative credit was used mainly for the purchase of seeds, fertilizers and pesticides. For the other input, farmers usually relied on their own funds.

The Reserve Bank of India\textsuperscript{17} viewed credit as the amount made available to the agriculturists for developing the farm and for meeting their cultivation, domestic or marketing expenses, to be repaid with interest at a later date.


\textsuperscript{17}Reserve Bank of India, \textit{Report on Credit Guarantee Corporation of India}, Bombay, 1971, p.65.
Sharma and Prasad\textsuperscript{18} had felt that credit, in addition to savings, was an important source for meeting the ever increasing capital needs of agriculture.

Grag\textsuperscript{19} had made an attempt to estimate the credit requirements of farmers in the changed pattern of agriculture and had concluded that the provision of credit had helped not only in increasing the total farm production and the income of the farmers but also in increasing the rate of growth of the national economy.

Sharma and Prasad\textsuperscript{20} had studied the credit needs of the farmers of different farm sizes and of different regions and at different stages of technological development in agriculture. The study had revealed that irrigated farms and farms which had already adopted improved technology required far more credit. Provision of adequate credit had increased the incomes of the farmers substantially even at the existing levels of technology.

Agricultural credit, according to G. Melvin Blase,\textsuperscript{21} was a powerful economic force to achieve development if it was used to inject appropriate inputs.


into agriculture, that were otherwise not possible for the farmers to provide from
their own financial, physical and labour resources.

According to Sharma and Prasad, credit, in addition to savings, was an
important source of meeting the ever increasing capital needs of agriculture. This
included both the variable and the fixed capital expenditure needs of the farmers.

According to P.K. Banerjee, credit needs for small farmers were
generally the expression used to denote the short-term credit requirements of the
farmers. Agricultural credit was the most urgently needed resource for the small
farmers. Not only their operational efficiency but their very survival depended
upon the flow of agricultural investment.

Ghosal is of the view that i) the conditions exist in Indian Agriculture
which would provide the stimuli of capital and leadership to this sector; and (ii)
the Indian farmers should be provided with alternative leadership and institutional
leadership may be encouraged. It is recommended that the loans should be
provided not only on the basis of value of land but also on the basis of value of

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24S.N. Ghosal, Agricultural Financing in India, Asia Publishing House,
Bombay, 1972, pp.287-308.
crop to be raised on that land. The co-operative structure may be adopted for serving and supervising the loans to the farmers.

Subramanian\textsuperscript{25} and Patel in their study in Andhra Pradesh had concluded that credit had helped all the size groups of farmers to increase their net farm incomes in the various different zones.

According to Hopkin et.al.,\textsuperscript{26} agricultural finance referred to the acquiring and controlling of assets, ownership by way of cash purchase, borrowings, leasing in and custom hiring.

Agrwal and Kumawat\textsuperscript{27} had proved that the provision of additional credit had increased the farm incomes even at the then existing levels of technology by 41 per cent, whereas the adoption of the new technology without additional credit had not resulted in any increase in the yield and the adoption of improved technology with additional capital in the form of credit had increased the farm

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\textsuperscript{25}K.V. Subramaniyan and R.K. Patel, “Impact of Capital Availability on Farm Income and Demand for Short-term Credit in West Godavari District, Andhra Pradesh”, \textit{Agricultural Situation in India}, Vol.28, No.3, 1973, pp.149-152.


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incomes enormously. Similar arguments had been advanced by Singh, 28 Subramanian 29 and Pandy. 30

Shukla and Mishra 31 in their study on credit in Uttar Pradesh had concluded that there was a positive impact of the co-operative finance on the levels of input, income and employment.

Randhawa and others 32 have given a detailed account of the origin of cooperative movement in Punjab. The first experiment in co-operation was made in Punjab in the village of Panjwar in 1895. It was a successful story.

This study assesses the co-operative movement in qualitative terms in Punjab during pre-Independence period as partially successful in achieving its objectives. The development of the movement was effectively supervised by the Co-operative Department of the State Government in the pre-Independence period


but performance was inadequate with respect to the coverage of villages. This, they observe, is also true for the post Independence period.

According to K. Sain,\textsuperscript{33} Co-operative credit can also result in the upliftment of agriculture by encouraging the farmers to increase their own irrigation potential to enable them to use chemical fertilisers, high yielding varieties of seeds, pesticides and adopt the modern techniques so that they can adopt the multiple cropping patterns.

Yadava et.al.,\textsuperscript{34} found that the adopting of the improved agricultural technology required greater amounts of money by way of investment. It was more so in the case of the small farmers who were frequently confronted with the problem of scarce resources. The study showed that all the small farmers studied required credit.

G.N. Singh et al.\textsuperscript{35} had also reported that, on an average, about 73.71 per cent of the co-operative loans were utilised for productive purposes. As the size of the farm increased the utilisation of the loans had also increased.

A number of studies had considered credit as the investment of funds used in the farm, obtained from off farm sources, which was repayable in future together with interest as agreed upon, either explicitly or implicitly and was a temporary measure of raising funds for defraying various obligations.\footnote{V.V. Desai, “Agricultural Credit”, \textit{Eastern Economist}, Vol.67, No.2, 1976, pp.82-92.}

Lavania\footnote{G.S. Lavania, “Impact of Bank Finance on Agricultural Incomes and Yields in Andhra Pradesh”, \textit{Financing Agriculture}, Vol.9, No.1, 1977, pp.12-15.} had studied the impact of bank finance on agricultural incomes and yields, and she had found that the farmers augmented their yields and their net incomes from their major crops through improved technology and by the available short term and medium term loans.

Ramadas\footnote{M. Ramadas, “Demand for and Productivity of Farm Credit in Pondicherry Region – An Economic Appraisal”, 1978, pp.112-116.} had studied the demand for and the productivity of the provision of farm credit in the Pondicherry region. This study had found that farm credit had a positive and significant impact on the productivity of the small and the medium farms.

Srivastava\footnote{Srivastava, “Estimation of Credit for Agriculture”, \textit{Financing Agriculture}, Vol.4, No.1978, pp.18-21.} had attempted to study the impact of farm credit with different levels of parameters. The study had disclosed a high positive marginal productivity of capital among all the groups of farmers who had utilised a less
than optimum level of credit. The production of crops and the net profits had increased with every successive additional unit of credit.

Krishnasamy\(^{40}\) had assigned an important role to the framework of a multi-agency approach comprising co-operatives, the commercial banks and the Regional Rural Banks, in meeting the credit needs of the farmers.

Rawat\(^{41}\) had defined credit as an important input in the production process, both in agricultural as well as the industrial sector.

There are many studies in which the importance of institutional credit in agriculture, in the context of new technology and agricultural development, is discussed. Dasgupta\(^{42}\) concentrates mainly on technological change in relation to productivity by taking into account the changing class relations in the historic context. She draws the conclusions that the technical change will have a positive contribution but it would depend upon the horizontal and vertical spread of technology. She further observes that there is little contribution of the new technology to improve the overall living conditions, and the quality of life in the countryside. In future, the effect of new technology on these aspects will depend:


\(^{42}\)Spira Dasgupta, \textit{Class Relations and Technical Changes in Indian Agriculture}, Institute of Economic Growth, New Delhi, 1980, p.29.
(i) on the public policies to regulate labour and land market; (ii) on the control of choice of factor combination on larger farms; and (iii) on the investing part of the surplus originating in agriculture.

Singh et.al.,\textsuperscript{43} attempted to study the impact of credit on farmers by comprising the beneficiaries and non-beneficiaries with the help of a few indicators such as the cropping pattern and the cropping intensity and they had indicated that there was a more significant development in the case of beneficiaries as compared with non-beneficiaries.

E.F. Rawat\textsuperscript{44} had felt that credit was an important input in the production process either in agriculture or in the industrial sector.

Misra\textsuperscript{45} had found that provision of short-term credit made a more favourable impact on the output of major crops, like paddy, wheat and sugarcane. The study had revealed that there was also much scope for increasing the medium and the long term advances to farmers.


\textsuperscript{44}E.F. Rawat, “Agricultural Finance”, \textit{The Journal of Indian Institute of Banker’s}, March 1980, p.42.

\textsuperscript{45}Jagadish Prasad Misra, \textit{An Economic Appraisal of Financing Organisations and their Operational Efficiency in Relation to Credit Seeds of the Farmers in Block Sadar, District Basti (U.P.)}, 1981, pp.87-92.
Joshi\textsuperscript{46} concluded that a single financial institution with fairly substantial resource meeting different needs of the agriculturists has its attraction instead of presently accepted multi-agency approach. The results reveal that loans borrowed from the State Bank of India by the active farmers for crop production purposes were not very helpful in increasing the productivity of land vis-a-vis non participation farmers.

Jha\textsuperscript{47} traces the origin of Land Development Banks and Co-operatives at the world level. Germany is the original home of land banks and co-operatives. The co-operatives are known as Landschaften in this country. The first bank of landschaft was created in 1769. Jha then discusses the emergence of Land Development Banks in India, particularly in Bihar.

Chitranjan\textsuperscript{48} was of the view that creditworthiness could also be improved by increasing the application of production techniques which resulted in saving land and using more of labour as the small and the marginal farmers had abundance of labour and scarcity of land resources. Creditworthiness could also be improved by evolving a production pattern which was market oriented and


\textsuperscript{47}Nand Kishore Jha, \textit{Bank Finance and Green Revolution in India}, Amar Prakashan, New Delhi, 1985, p.36.

biased against self-consumption. An obvious implication of such an approach would be to encourage the small farmers and the marginal farmers to switch over to the cultivation of more and more of the cash crops.

The study undertaken by J.M. Mulani\(^{49}\) had revealed that the provision of co-operative agricultural credit in Gujarat had not only strengthened the productive capacity of the small land holdings, but had also helped those small farmers in raising their standards of living.

Rath\(^{50}\) explained that with planned economic development, the accentuated capital investment and technological innovations in crops and inputs have led the farmers to resort to loan finance to a much larger extent than before. Because of this, two more institutions instead of co-operatives, namely commercial banks and Regional Rural banks have been inducted into the field. While it would be fair to expect farmers in a developing economy to finance a larger part of their current farm expenses from their own sources, it would be useful to know what, in fact, has been happening over the years. Rath has cautioned about the relative neglect of co-operative institutions and adhoc approaches seem to have reduced the flow of credit to agriculture. Unless corrective measures are taken the co-operatives


would get choked and the alternative will be costly and ineffective. The institutional credit requirements are estimated by D.K. Desai\textsuperscript{51} for the years 1990, 1995 and 2000 A.D. The total short term credit requirements for the agricultural production sub-system at the reduced level as per Alternative III are estimated at Rs.14,050 crore in 1990, Rs.28,970 crore in 1995 and Rs.49,200 crore by 2000 A.D.

V.M. Dandekar\textsuperscript{52} has traced the development of agricultural credit in India during the 19\textsuperscript{th} and 20\textsuperscript{th} centuries. The development of co-operative finance and supply of agricultural credit by commercial banks and Regional Rural Banks (RRBs) is evaluated. The finances at the time of Independence were available to agriculturists from the government departments, co-operatives, and to a small extent, from the commercial banks. However, the most important source was the moneylender. Several committees have mentioned about the poor health of agricultural credit institutions. These committees ended up recommending bypasses to let the credit flow around the overdues. Overdues are mounting in agricultural credit. The new thinking about agricultural credit is contained in the reports of the Credit Review Committee (1989) and the Committee on Financial


System (Narasimham Committee Report, 1991). But both the committees fail to consider how to reorganize the structure of rural credit. Many committees noted the weak base (the primary credit societies) of the entire co-operative credit structure. But these committees did not realize that the primary societies are weak because their lending business is essentially non-viable. To reorganize the present banking system, commercial as well as co-operatives, it is suggested that: (i) various co-operative credit institutions should be allowed to function so long as they are commercially viable. Otherwise, they should be gradually phased out; (ii) the commercial banks, as the committee on Financial Systems (1991) had suggested should be reorganized. This reorganization of the banking structure should consist of (a) three or four large banks (including the State Bank of India) which could become international in character, (b) ten national banks with a network of branches throughout the country (c) local banks whose operations would be generally confined to specific regions and (d) rural banks (including RRBs) whose operation would be confined to the rural areas mainly to finance agriculture and allied activities. Due to the present day complexities, no single bank can serve all the sectors. Hence, each bank, at least the nationalised banks, should be asked to progressively specialise in one or more areas and withdraw from the rest.
C.H. Hanumantha Rao highlights the growth and expansion of institutional credit, particularly through commercial banking. The period obtaining after Independence has been divided into three phases; (i) the early fifties to the late sixties; when the major policy objectives was replacement of the informal sources (ii) the late sixties to the early eighties; the period witnessed the nationalisation of leading commercial banks and the massive expansion in the branches of commercial banks in rural areas; and (iii) the last phase which starts in the early eighties with the beginning of the Sixth Five Year Plan which is characterised by growing overdues in respect of loan repayment, loan waivers, and write-offs. Rao raises the policy issues relating to the viability of credit institutions, equitable access to credit, and redefinition of priority sector and enhanced role of rural banking institutions to cope with the emerging challenges. It is necessary for the developmental role of institutional credit that the institutional credit should be complemented by infrastructure and technology. In the credit plans more emphasis should be on non-farm and allied agricultural activities.

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Kulwant Singh\textsuperscript{54} in his work entitled ‘Co-operative Agricultural Credit Utilisation in Himachal Pradesh’ had analysed and concluded that in recent years, the requirements of agricultural credit had assumed significant dimensions due to the increasing thrust in the development of new technology in the agricultural sector.

Sankarama and others\textsuperscript{55} (1996) looked into some important aspects of co-operation in the economic field. The broad classification of themes covers “Bases of Co-operatives”, ‘Strategies for the Models of Tomorrow’ and ‘Co-operatives in the Emerging Context’. The main conclusion of Sankarama’s study is that the problem of rural leadership is different from that of other leadership. The leadership plays a significant role in shaping the social, cultural, political, and economic life of rural population. The leadership qualities in rural areas can be noted as power oriented, achievement oriented and affiliation oriented.

Mitra and Lahiri\textsuperscript{56} have evaluated the expectations from the co-operatives. A potential borrower will have to depend on the moneylender with whom he has some personal relation. This dependence on a single moneylender confers a

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monopoly of power on the moneylender. This also results in an exorbitantly high rate of interest. It is suggested by many quarters that to reduce the poor producers’ dependence on money lenders, consumption loans through co-operatives should also be provided.

According to Sankaran, the success of decentralisation is very much dependent on the operationalisation of people’s participation in planning through linkages with grass roots organisations which are closer to the village population, such as the Primary Agricultural Co-operative Societies (PACs). Given the primacy of PACs as genuine development oriented autonomous associations of people, PACs have been accepted as one of the useful agencies to translate the principle of people’s participation in Panchayat level planning. The mechanics of the proposed Panchayat PACs linkages towards the development perspective consists of a Joint Planning and Co-ordination Committee (JPCC) with representatives drawn from credit, development and community service institutions.

Mahajan outlines the context in which the Bharatiya Samrudhi Investment and Consulting Service (BASICs) an innovative rural financial

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initiative in India, was born. The BASICs idea emanates from the need; (a) to generate a large number of sustainable livelihoods; (b) to generate employment, particularly through rural small enterprises and self employment (c) to provide technical assistance and support services, particularly to the poor borrowers.

Sahoo and Maharana\textsuperscript{59} have investigated the emerging trends in institutional development in the co-operative credit structure. The demands on the co-operative credit structure are likely to increase with the growing requirements of agriculture. The implementation of Development Action Plans (DAPs) which was worked out by NABARD in 1993, and conduct of Organization Development Intervention Programme (ODIPs) for an attitudinal reorientation of the co-operative personnel, indicates that the co-operative credit institutions can be a competitor in the rural credit delivery system, given the necessary direction and support. The following suggestions are given to strengthen the co-operative institutions (i) the functional autonomy to the co-operative sector on the lines of Panchayat Raj Institutions, (ii) democratization and de-bureaucratization of management (iii) rationalization of the interest rate structure in view of the flexibility given to the co-operatives (iv) strengthening of HRD (v) better recovery climate and non-intervention by government (vi) strengthening of primary units; and (vii) grooming of non-officials as leaders.

Navjot Sandhu,\textsuperscript{60} in his paper examines the finance gap literature relating to farmers in general and specifically in India; reviews the financial provision and investigates the lending policies of financial institutions. The study investigates the relationship between education, level of income, social class and the relationship between farmers and financial institutions. The results show that credit limits adversely impact on the efficiency of smaller farmers; information asymmetry and underdevelopment of financial markets for small farmers lead to financial exclusion and negatively impact on economic development.

Agro-Economic Research Centre,\textsuperscript{61} in the study stated that the institutional farm credit had expanded very rapidly in India, especially, after the nationalization of major commercial banks in the country. It has reached even to the remotest villages which were hitherto, neglected with regard to the supply of formal farm credit. Institutional finance has come to play a significant role since the seventies with the entry of commercial banks, rural banks, the NABARD, etc., into the credit market to support the co-operatives that were already in the field. Concurrent to the unprecedented increase in the disbursement of both production and investment credit there has been an undesirable increase in the quantum of farm credit overdues.

\textsuperscript{60}Navjot Sandhu, \textit{“Finance Gap amongst Smaller Farmers in India, Punjab”}, University of Central England (UK), www.google\farmers position in India.

\textsuperscript{61}Agro-Economic Research Centre, \textit{“Recovery Performance of Institutional Farm Credit in Rajasthan and Andhra Pradesh”}, Waltair.
Sriram\textsuperscript{62} in his study stated that the policy intervention in agriculture had been credit driven. This is even more pronounced in the recent interventions made by the State in the package announced for distressed farmers, in doubling agricultural credit, providing subvention and putting an upper cap on interest rates for agricultural loans. We use existing literature and data to argue that the causality of agricultural output with increased doses of credit cannot be clearly established. We argue that Indian agriculture is undergoing a fundamental change, wherein the technology and inputs are moving out of the hands of the farmers to external suppliers. This, over a period of time may have resulted in the deskilling of farmers and without adequate public investments in support services and without appropriate risk mitigation products, has created a near-crisis in agriculture. Thus, we argue that policy interventions have to be necessarily patient and holistic. Looking specifically at the rural financial markets using some primary data, we argue that it is necessary to understand the rural financial markets from the demand side. We conclude the article by identifying some directions in which the policy intervention could move, keeping the overall rural economy in view rather than being focused only on agriculture.

2.2 METHODOLOGY

Designing a suitable methodology and the selection of proper analytical tools are important for a meaningful and useful analysis in any research undertaking. In this section, an attempt has been made to describe the methodology which includes the reasons for the choice of study area, sample design, period of study, method adopted for the collection of data, method of analysis and tools of analysis.

2.2.1 Sample Design

The stratified multistage random sampling technique has been adopted for the study taking Virudhunagar district as the universe, blocks as the stratum, villages as the primary unit and the beneficiary farmers as the ultimate unit.

In Virudhunagar district, there are 248 commercial bank branches, which have been providing agricultural credit to the farmers under a Lead Bank Scheme namely Indian Overseas Bank. A list of the borrowers from each block was obtained from the records of Lead Bank for the year 2007-08. Three blocks namely Rajapalayam, Sattur and Aruppukottai and five villages in each block which have the highest number of beneficiaries was selected for primary data collection. A total of 600 borrowers were randomly selected from 15 villages by adopting the proportionate random sampling technique.
2.2.2 Collection of Data

Both primary and secondary data were used for the present study. A reconnaissance survey was conducted by meeting the farmers, particularly paddy cultivators, so that the researcher could get fully acquainted with various stages of agricultural operations, various kinds of investments made by farmers and the actual farming conditions. On the basis of the information gathered, a well-designed pre-tested interview schedule was prepared and used in the field survey for the collection of primary data. Before undertaking the main survey a tentative interview schedule was prepared and administered to 20 farmers on a pilot basis in order to test the correctness of the interview schedule. It helped the researcher to delete the unwarranted questions and add a few relevant questions and the modified final schedule was prepared and used.

The selected farmers were contacted in person and the objectives of the study were clearly explained to them, and their co-operation was secured. The details regarding the characteristics of the sample farmer, his farm structure, the size of his holding, his cropping pattern, his investment pattern in farm assets, his costs and returns, the net incomes received by him and the other aspects relating to the present study were collected from each of the sample farmers through the personal interview method.
Secondary sources of data relating to location, climate, rainfall, soil types, land utilisation patterns, yield and production of the major crops, cropping pattern and the like were collected from the Office of District and Taluk Statistical officers. The data regarding the list of members, loans issued, outstandings, overdues and recoveries were collected from the records of the Lead Bank.

2.2.3 Period of Study

The field survey was conducted during 2008-09, for the purpose of collection of primary data. The reference period of the survey pertained to the agricultural year, 2008-09.

In order to evaluate the performance of commercial banks in terms of the loans issued, recovery, outstanding and overdues, data were obtained for a period of 11 years from 1998-99 to 2008-09 from the Annual Credit Plans (ACPs) of the Lead Bank.

2.2.4 Methods of Analysis

Keeping in view the objectives of the study, the selected 600 sample beneficiaries were stratified into two categories, namely marginal and small farmers. Out of the 600 sample farmers, 232 sample farmers (38.67 per cent) and the remaining 368 sample farmers (61.33 per cent) are under the category of large and small farmer groups respectively. Further, the sample farmers were post
stratified into non-defaulters and defaulters. Out of the 232 large farmers, 136 (58.62 per cent) belong to non-defaulter group and the remaining 96 (41.38 per cent) belong to defaulter group. In the small farmer group, out of 368 sample farmers, 156 (42.39 per cent) and 212 (57.61 per cent) belong to non-defaulter and defaulter groups respectively.

2.2.5 Tools of Analysis

In order to analyse the trend and growth of the amounts of credit issued, recovered, and the amounts which fall in the category of outstandings and overdues, the following semi-log trend equation was fitted.

\[ \log Y = a + bt \]

where,

- \( Y \) represented the variable and
- \( T \) represented the time period.

To compute the compound growth rate, the following formula was used:

\[ \text{Compound Growth Rate (CGR)} = [(\text{Anti log } b-1) \times 100] \]

In order to assess the impact of credit on production, the following form of the Cobb-Douglas type of production function was used.
\[
\log Y = \beta_0 + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + u
\]

where,

- \( Y \) = Per acre value of output (Gross returns) including by-products in rupees,
- \( X_1 \) = Per acre value of the fixed capital in rupees,
- \( X_2 \) = Per acre cost of labour in rupees,
- \( X_3 \) = Per acre value of working capital in rupees,
- \( X_4 \) = Per acre value of agricultural credit in rupees,
- \( U \) = Disturbance term and
- \( \beta_0, \beta_1, \ldots, \beta_4 \) are the parameters to be estimated.

To examine the structural differences between the beneficiaries’ and the non-beneficiaries’ groups of farmers, the following form of a model was estimated by the method of least squares separately, for the beneficiaries’ group, the non-beneficiaries’ group and for the pooled total category of the sample farmers.

\[
\log Y = \beta_0 + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + u
\]

where,

- \( Y, X_1, X_2 \) and \( X_3 \) are as indicated in the model

The structural differences were examined by testing the equality of the parameters of regression models estimated for the beneficiaries’ and the non-beneficiaries’ and following form of Chow’s F-test was carried out.
\[
P = \frac{\sum e^2 - (\sum e_1^2 + \sum e_2^2)}{\sum e_1^2 + \sum e_2^2 / n_1 + n_2 - 2k}
\]

where

\[\sum e^2 = \text{unexplained or residual sum of squares of the pooled sample of both the beneficiaries’ and non-beneficiaries’ groups of farmers},\]

\[\sum e_1^2 = \text{unexplained or residual sum of squares of the sample corresponding to the beneficiaries’ groups},\]

\[\sum e_2^2 = \text{unexplained or residual sum of squares of the sample corresponding to the non-beneficiaries’ groups},\]

\[K = \text{the number of parameters included in the regression model},\]

\[N_1 = \text{sample size of the beneficiaries’ groups},\]

\[N_2 = \text{sample size of the non-beneficiaries’ groups}.\]

In the case of structural differences the credit dummy was introduced at the intercept level in the regression model.

The regression model became

\[\log Y = \beta_0 + \alpha D \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + u\]

where,

\[D = 1 \text{ if the sample farmer is a beneficiary}\]

\[= 0 \text{ otherwise}.\]

The above equation was estimated by the method of least squares.

The regression co-efficient of different inputs estimated from the different regression models could be used to compute the returns to scale also. The returns
to scale were either increasing or remained constant or were decreasing according as, the sum of the regression co-efficients were greater than, equal to or were less than unity.

But one should be more concerned with the results which were based upon statistical tests rather than upon the rough summary results. According to Singh, the statistical test should be as follows:

\[ t = \frac{\sum \beta_i - 1}{SE (\sum \beta_i)} \]

where

- \( \sum \beta_i \) = Sum of the co-efficients
- \( SE \) = Standard Error.

Capital investment in agriculture by the farmers and the extent of capital investment were measured with the help of a scale constructed by making use of the selected 10 components.

In order to examine the factors influencing capital investment in agriculture the Chi-square test was applied. The following formula was used for computing \( \chi^2 \).

\[ \chi^2 = \sum \frac{(O - E)^2}{E} \]

Where \( O \) represented observed frequency

\( E \) represented expected frequency; and
'Degrees of freedom' was (r-1) (c-1)

where 'r' represented the number of rows; and
'c' represented the number of columns in the contingency table.

The information collected from bank and the borrowers indicates the reasons and effects of overdues.

Deciding factors of repayment capacity of default borrowers was determined by

\[ R = Y - [C + L + K] \]

where,

- \( R \) = Repayment capacity of the borrower in Rs.
- \( Y \) = Total income from farming and other source in Rs.
- \( C \) = Total farm and off farm expenses in Rs.
- \( L \) = Pre-existing liabilities to be met within a year in Rs.
- \( K \) = Risk taking allowance to the farmer borrowers in Rs.
  (15 percent of total income)

**Linear Discriminant Function Analysis**

On the basis of difference in the socio-economic characteristics of the borrowers, linear discriminant analysis was used to classify the borrowers into defaulters and non-defaulters and again the defaulters were classified into willful defaulters and non-willful defaulters. The distance between two groups of borrowers was calculated by Mahalanobis \( D^2 \) test. Socio-economic characteristics
and its significance were tested as a first step of analysis to make sure whether these groups of borrowers (defaulters and non-defaulters or willful defaulters and non-defaulters) are significantly different from each other as regards the means of the characters under study.

Discriminant function is stated here

\[
Z = \sum_{i=1}^{12} l_i \cdot x_i
\]

\[
Z = l_1 x_1 + l_2 x_2 + \cdots + l_n x_n
\]

\(x_i\) (\(i = 1, 2, 3, \ldots, 12\))

\(d_i\) (\(i = 1, 2, 3, \ldots, 12\))

where,

\(Z\) = Total sum of discriminant score (it may be the score for non-defaulters and defaulters or willful defaulters and non-willful defaulters)

\(x_i\) = The value of \(i^{th}\) characteristics

\(l_i\) = Total land holdings in acres (own land, leased in, leased out land are taken into account)

\(x_2\) = Operational size of holdings in acres (cultivable land alone)

\(x_3\) = Level of education

Score for illiterate = 1,
Primary education = 2,
High/Higher Secondary education = 3,
Technical education = 4,
Graduation and above = 5
\( x_4 \) = Caste
Score for SC = 1, Other than SC = 0

\( x_5 \) = Borrowers’ age in years

\( x_6 \) = Percentage of area under High Yielding Varieties (HYV)

\[ x_6 = \frac{\text{Total operated area under HYV’s}}{\text{Total operated area}} \times 100 \]

\( x_7 \) = Intensity of cropping in percentage

\[ x_7 = \frac{\text{Total annual cropped area in acres}}{\text{Total land holdings in acres}} \times 100 \]

\( x_8 \) = Percentage of income from agriculture

\[ x_8 = \frac{\text{Net income from agriculture}}{\text{Total income}} \times 100 \]

\( x_9 \) = Annual per capita family consumption expenditure in Rs.

\[ x_9 = \frac{\text{Total consumption expenditure}}{\text{Family Size}} \times 100 \]

\( x_{10} \) = Per acre fertilizers used in Rs.

\( x_{11} \) = Amount of loan borrowed from the bank

\( x_{12} \) = Working capital used in Rs. Per acre
(Seeds, weedicides, fungicides and pesticides are included)
185 defaulters and 115 non-defaulters were selected for the study. Amongst 185 defaulters there were 112 non-willful defaulters and 73 willfull defaulters.

2.3 CONCEPTS

2.3.1 Crop Production

The estimates of crop production are prepared by multiplying the output with the prices prevailing at the time of harvesting, and production of fodder crops is computed on the basis of price prevailing in the village and market.

2.3.2 Assets\(^{63}\)

We have estimated the value of fixed assets which include farm land, farm buildings, livestock, farm machinery and implements, non-agricultural assets, residential buildings, and financial assets. The value of land is calculated on the basis of price prevailing in the area at the time of survey. Similarly, farm building, livestock, and residential buildings are valued at local market prices. The farm implements and machines are valued at cost minus depreciation. The depreciation is calculated by straight line method, which assumes depreciation at equal rate as the asset grows in age. A similar method is adopted for estimating the value of non-agricultural assets. Financial assets include share in co-operatives, deposits

with co-operatives, postal savings, deposits with commercial banks life insurance premium paid, and loans due from others.

2.3.3 Family Expenditure

Family expenditure consists of expenditure on durable and non-durable consumption item such as food, clothes, fuel, machine, education, household goods, travelling, recreation, marriage and social ceremonies.

2.3.4 Total Borrowings

Gross borrowings of sample households are computed by summing up the amount of money borrowed from all sources during the reference year. This includes institutional as well as non-institutional borrowings, and short term and long term loans.

2.3.5 Net Household Income

Net income of the household is estimated by deducting material inputs and capital consumption from the gross farm output. Salaries and wages earned from employment by the members of the family, income from business other than agriculture and allied activities, remittances from abroad, and income from any other sources are added to the farm business income to arrive at the net household income.
2.3.6 Repaying capacity

The repaying capacity of a farm household is calculated by deducting working capital (excluding short-term loans) and family expenditure from total income of the household.

2.3.7 Outstanding Loans

The amount left with the borrowers for realization on a particular date is called outstanding loans. Outstanding loans are estimated total borrowings minus amount repaid.

2.3.8 Household

A household is defined as a group of persons normally living together and taking food from a common kitchen.

2.3.9 Owned Land

This included land owned as well as the land over which there is a right of permanent heritage possession.

2.3.10 Operational Holding

All land which is used wholly or partly for agricultural production and is operated (directed/managed) by a household alone or jointly with other
households, with or without the assistance of others and regardless of title, size or location, constitutes, an operational holding. The parcels of land in an operational holding together constitute one technical unit, i.e., a unit with more or less independent technical resources covering land, implements and livestock.

2.3.11 Agricultural Labour

A person is considered as an agricultural labourer, if he follows any of the following agricultural operations in the capacity of a labourer on hire or on exchange: (i) farming, (ii) dairy farming (iii) production of any horticultural commodity, (iv) raising of livestock, bee keeping or poultry farming and (v) any work performed on a farm in connection with farm operations.

2.3.12 Agriculturist Moneylender

Agriculturist moneylender is defined as one having agriculture as his major occupation and moneylending as subsidiary business.

2.3.13 Professional Moneylender

A professional moneylender is a person receiving major part of his income by money lending.

2.3.14 Relative and Friends

All loans received from relatives or friends free of interest are classified as borrowings from 'relatives' or 'friends'. If, however, a loan advanced is not interest
free, it is then classified under an appropriate agency such as agriculturist moneylender or professional moneylenders, depending upon the occupation of the person who advanced the loan.

2.3.15 Credit

Credit is a financial facility, which enables a person or business to borrow money to purchase products, raw material, components, and so on and to pay for them over an extended time period. This is linked with credit worthiness in the sense that it is a source of honour and pride, of a persons financial standing and of the acknowledgement of being paid by an entry on the credit side of an account.

2.3.16 Debt

Debt is defined as an amount of money owned by a person, firm, or government to a lender. It is a state of obligation to something owned.

2.3.17 Loan

It is the advance of a specified sum of money to a person or business (the borrower) by another person or business or money particularly by a specialist financial institution (the lender), which makes its profits from the interest charged on loans. It is something lent, especially a sum of money to be returned normally with interest.

2.3.18 Borrow

It is to acquire something, especially money, temporarily with the promise or intention of returning. Borrowing is an economic bargain with a pledge.
2.3.19 Farmer

This refers to a person who holds land either own land or who performs the profession of agriculture to lead his life. Farmers are classified into three categories on the basis of size of land holding.

2.3.20 Demand for Agricultural Loans

The term demand for agricultural loan refers to the amount needed by the farmers to meet out the cost of cultivation.

2.3.21 Overdues

Normally banks lend loan with due dates. When a particular loan is not repaid on the due dates it becomes overdue and the total of such overdue loans is described as overdues.

2.3.22 Defaulters

The farmers who have not repaid loan on the due date are defaulters. Defaulters are classified into 2 categories according to their loan repayment. They are:

(i) Willful Defaulters

The farmers who did not repay the loan in time even when they have the capacity to repay are named as willful defaulters and
(ii) **Non-willful Defaulters**

Farmers who are eager to repay but due to certain uncertainties, surroundings and their business environment, they could not repay the loan in time.

**2.3.23 Non-Defaulters**

The farmers who repay the loan on due date without failure.