CHAPTER - II

REVIEW OF LITERATURE AND METHODOLOGY

2.1 Introduction

2.2 Review of relevant literature

2.3 Methodology

2.4 Concepts

2.5 Summary
2.1 INTRODUCTION

A review of earlier studies is essential to know the areas already covered and to get necessary insights. The studies reviewed are excellent source to understand the process of change through they do not provide precise estimate of impact assessment of parameters.

2.2 REVIEW OF RELEVANT LITERATURE

Various studies have already been undertaken relating to agricultural credit. A few important studies in this regard have been critically reviewed in the following pages.

Grag (1971)\(^1\) 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 (1971)\(^2\) 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

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credit had increased the income of the farmers substantially even at the existing levels of technology.

Agricultural credit, according to G. Melvin Blase (1971)\(^3\) 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.

Sharma and Prasad (1971)\(^4\) had studied 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.

Banerjee (1971)\(^5\) declares that the 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.

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Ghosal (1972)\textsuperscript{6} 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 crop to be raised on that land. The co-operative structure may be adopted for serving and supervising the loans to the farmers.

Subramanian and Patel (1973)\textsuperscript{7} 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.

Hopkin et al. (1973)\textsuperscript{8} had studied agricultural finance referred to the acquiring and controlling of assets, ownership by way of cash purchase, borrowings, leasing in and custom hiring.

Agarwal and Kumawat (1974)\textsuperscript{9} 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

\begin{itemize}
  \item Ghosal, S.N., \textit{Agricultural Financing in India}, Asia Publishing House, Bombay, 1972, pp. 287-308.
  \item Subramaniyan, K.V. and Patel, R.K., “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.
\end{itemize}
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 incomes enormously. Similar arguments had been advanced by Singh,\textsuperscript{10} Subramanian\textsuperscript{11} and Pandy.\textsuperscript{12}

Shukla and Mishra (1974)\textsuperscript{13} 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 (1974)\textsuperscript{14} have given a detailed account of the origin of co-operative movement in Punjab. The first experiment in co-operation was made in Punjab in the village of Panjwar in 1895, which was considered as successful movement.

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.

Sain (1974)\textsuperscript{15} had studied the 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 \textit{et al.} (1975)\textsuperscript{16} 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.

Singh \textit{et al.} (1976)\textsuperscript{17} 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 (1976).\textsuperscript{18}

Lvania (1977)\textsuperscript{19} had studied the impact of bank finance on agricultural incomes and yields, and he had found that the farmers augmented their yields and their net incomes from their major crops through improved technology and by the available of short term and medium term loans.

Ramadas (1978)\textsuperscript{20} 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 (1978)\textsuperscript{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 (1979)\textsuperscript{22} 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 (1980)\textsuperscript{23} 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 (1980)\textsuperscript{24} 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

\textsuperscript{24} Spira Dasgupta, \textit{Class Relations and Technical Changes in Indian Agriculture}. Institute of Economic Growth, New Delhi, 1980, p. 29.
will depend: (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. (1980)\textsuperscript{25} 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 the beneficiaries as compared with non-beneficiaries.

Misra (1981)\textsuperscript{26} 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.

Joshi (1985)\textsuperscript{27} 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

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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 (1985)\textsuperscript{28} 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.

Chitrnanjan (1986)\textsuperscript{29} 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 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.

\textsuperscript{28} Nand Kishore Jha, \textit{Bank Finance and Green Revolution in India}, Amar Prakashan, New Delhi, 1985, p.36.

\textsuperscript{29} Chitrnanjan, “Credit Rationing - A Perspective”, \textit{Financing Agriculture}, Vol. 18, No. 324, July-December, 1986, pp. 8-10.
Mulani (1988)\textsuperscript{30} 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 (1989)\textsuperscript{31} 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, infact, 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 (1988)\textsuperscript{32} for the years 1990, 1995 and 2000 A.D. The total short term credit requirements for the agricultural production sub-

\begin{flushleft}
\textsuperscript{30} Mulani, J.M., “Co-operative Changes and Face of Gujarat Villages”, \textit{Kissan World}, April 1988, p. 27.


\end{flushleft}
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.

Dandekar (1994)\textsuperscript{33} 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 moneylenders. Several committees have mentioned 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. On account of 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.

Hanumantha Rao (1994)\textsuperscript{34} highlighted the growth and expansion of institutional credit, particularly through commercial banking. The period of post 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.

Kulwant Singh (1996)\textsuperscript{35} 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{36} (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

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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 (1996)\(^{37}\) 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 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.

Sankaran (1996)\(^{38}\) opined that 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 (1996)\(^{39}\) explained the context in which the Bharatiya Samrudhi Investment and Consulting Service (BSICS) an innovative rural financial initiative in India, was born. The BSICS 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 (1996)\(^{40}\) 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,41 in his paper studied the finance gap literature relating to farmers in general and specifically in India; reviewed 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.

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41 Navjot Sandhu, “Finance Gap amongst Smaller Farmers in India, Punjab”, University of Central England (UK), www.google\farmers position in India.
Agro-Economic Research Centre,\textsuperscript{42} 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.

Sriram (2007)\textsuperscript{43} 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.

The existing literature and data argue that the causality of agricultural output with increased doses of credit cannot be clearly established. It is a fact that Indian agriculture is undergoing a

\begin{itemize}
\item Agro-Economic Research Centre, “\textit{Recovery Performance of Institutional Farm Credit in Rajasthan and Andhra Pradesh}”, Waltair.
\end{itemize}
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, it is found that policy interventions have to be necessarily patient and holistic. Looking specifically at the rural financial markets using some primary data, shows that it is necessary to understand the rural financial markets from the demand side. It leads to the identification of some directions in which the policy intervention could move, keeping the overall rural economy in view rather than being focused only on agriculture.

2.3 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 included the reasons for the choice of the study area, the sample design, the period of study, the method adopted for the collection of data, the method of analysis and tools of analysis.
2.3.1 Sampling Technique

Kanyakumari District consists of four taluks with 9 blocks. The four taluks namely Thovalai, Agasteeswaram, Kalkulam and Vilavancode which had the largest area under paddy cultivation during 2009-2010 were selected for primary data collection. In each taluk, the villages which show the highest number of beneficiaries who availed of loan from Lead Bank were chosen as the primary unit of data collection. For this, the list of beneficiaries (borrowers) was obtained from the Lead Bank (Indian Overseas Bank) in Kanyakumari District. The proportionate stratified sampling technique had been adopted to select randomly 150 beneficiaries. Equal weightage was given to the random selection of 150 non-beneficiaries (non-borrowers) in the same villages for primary data collection. The list of sample villages and the number of beneficiaries and non-beneficiaries selected in each village are presented in Table 2.1.
Table 2.1
Villages and Number of Selected Beneficiaries and Non-Beneficiaries as on March 2009

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the taluks and villages</th>
<th>Beneficiaries</th>
<th>Non. beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total farmers</td>
<td>Sample farmers</td>
</tr>
<tr>
<td>I</td>
<td>Thovalai</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Thovalai</td>
<td>180</td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>Boothapandi</td>
<td>196</td>
<td>19</td>
</tr>
<tr>
<td>II</td>
<td>Agasteeswaram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Rajakkamangalam</td>
<td>186</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>Perumalpuram</td>
<td>225</td>
<td>22</td>
</tr>
<tr>
<td>III</td>
<td>Kalkulam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Kurunthancode</td>
<td>113</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>Thiruvattar</td>
<td>159</td>
<td>16</td>
</tr>
<tr>
<td>IV</td>
<td>Vilavancode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Melpuram</td>
<td>216</td>
<td>22</td>
</tr>
<tr>
<td>8</td>
<td>Arumanai</td>
<td>232</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1507</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1571</td>
<td>150</td>
</tr>
</tbody>
</table>

Source: Report, Annual credit plan 2009-2010, Lead Bank (Indian Overseas Bank), Kanyakumari District.

2.3.2 Collection of Data

Both primary and secondary data had been 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 the various stages of agricultural operations,
various kinds of investments made by the 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 cooperation was secured. The details regarding the characteristics of the sample farmers, his farm structure, the size of his holding, his cropping pattern, his investment pattern in farm assets, his costs and returns, the net income 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, the cropping pattern and the like were collected from the Office of District and Taluk Statistical Officers. The data regarding the list of members, the loans issued, the outstanding loans, overdues and recoveries were collected from the records of the Lead Bank.
2.3.3 Period of Study

The field survey was conducted during 2009-10, for the purpose of collection of primary data. The reference period of the survey pertained to the agricultural year, 2009-10.

In order to evaluate the performance of the Lead Bank in terms of the loans issued, recovery, outstanding loans and overdues, data were obtained for a period of 10 years from 2000-01 to 2009-10 from the Annual Credit Plans (ACPs) of the Lead Bank namely Indian Overseas Bank.

2.3.4 Methods of Analysis

Keeping in view the objectives of the study, the selected 300 sample farmers were stratified into two categories, namely small and large farmers. Out of the 150 sample beneficiaries, 97 sample farmers (64.67 per cent) and the remaining 53 sample farmers (35.33 per cent) are under the category of small and large farmer groups respectively. Out of 150 sample non-beneficiaries, 94 (62.67 per cent) belong to small farmers group and the remaining 56 (37.33 per cent) belong to large farmers group.

2.3.5 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
outstanding dues 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:

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

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
- \( \beta_0, \beta_1... \beta_4 \) are the parameters to be estimated.
To examine the structural differences between the beneficiaries and the non-beneficiaries, the following form of a model was estimated by the method of least squares separately, for the beneficiaries, the non-beneficiaries 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 the regression models estimated for the beneficiaries and the non-beneficiaries and following form of Chow’s F-test was carried out.

\[ F = \frac{\sum e^2 - (\sum e^2_1 + \sum e^2_2)/k}{\sum e^2_1 + \sum e^2_2 / n_1 + n_2 - 2k} \]

Where

\( \sum e^2 = \) unexplained or residual sum of squares of the pooled sample of both the beneficiaries and non-beneficiaries,

\( \sum e^2_1 = \) unexplained or residual sum of squares of the sample corresponding to the beneficiaries,

\( \sum e^2_2 = \) unexplained or residual sum of squares of the sample corresponding to the non-beneficiaries,
\[ k = \text{the number of parameters included in the regression model,} \]
\[ n_1 = \text{sample size of the beneficiaries,} \]
\[ n_2 = \text{sample size of the non-beneficiaries.} \]

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

The regression model became

\[ \log Y = \beta_0 + \beta_1 \log x_1 + \beta_2 \log x_2 + \beta_3 \log x_3 + u \]

Where,

Where \( D = 1 \) if the sample farmer is a beneficiaries

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

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-efficient was greater than, equal to or 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

\( \Sigma \beta_i \) = Sum of the co-efficient

\( SE \) = 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.

2.4 CONCEPTS

2.4.1 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.

2.4.2 Assets

The value of fixed assets which include farm land, farm buildings, livestock, farm machinery and implements, non-agricultural assets, residential buildings, and financial assets has been estimated. The value of land is calculated on the basis of the 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.\textsuperscript{44}

\textbf{2.4.3 Family Expenditure}

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

\textbf{2.4.4 Total Borrowings}

Borrowings of sample households are computed by summing up the amount of money borrowed from the Lead Bank during the reference year. This includes short term and long term loans.

\textbf{2.4.5 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 source are

added to the farm business income to arrive at the net household income.

2.4.6 Repaying Capacity

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

2.4.7 Outstanding Loans

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

2.4.8 Household

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

2.4.9 Owned Land

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

2.4.10 Operational Holding

All land which is used wholly or partly for agricultural production and is operated (directed or 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.

2.4.11 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 money lending as subsidiary business.

2.3.13 Professional Moneylender

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

2.4.14 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 moneylender, depending upon the occupation of the person who advanced the loan.

2.4.15 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.

2.4.18 Borrowing

It is to acquire something, especially money, temporarily with the promise or intention of returning. Borrowing is an economic bargain with a pledge.
2.4.19 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 two categories on the basis of size of land holding.

The farmers with less than 5 acres of cultivation (small farm) are classified as the small farmer group. The farmers with more than 5 acres of cultivation (large farm) are classified as the large farmer group.

2.4.20 Demand for Agricultural Loans

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

2.4.21 Overdues

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

2.4.22 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.
2.4.23 Willful Defaulters

The farmers who did not repay the loan in time even when they had the capacity to repay are named as willful defaulters.

2.4.24 Non-Willful Defaulters

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

2.4.25 Non-Defaulters

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

2.4.26 Beneficiaries

The farmers who borrow loan from the Lead Bank.

2.4.27 Non-beneficiaries

The farmers who do not borrow loan from the Lead Bank.

2.5 SUMMARY

In this chapter illustrates the review of past studies in relation to agricultural credit and methodology, which includes the reasons for the choice of the study area, the sampling design, the period of study, the method adopted for the collection of data, the methods of analysis, tools of analysis and concepts used.