

**REGIONAL VARIATIONS IN THE DISTRIBUTION AND  
GROWTH OF FARM CREDIT IN INDIA**

*Dissertation submitted to Jawaharlal Nehru University  
in partial fulfilment of the requirements  
for the award of the Degree of*

**MASTER OF PHILOSOPHY**

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**NEW DELHI- 110067**

**INDIA**

**2011**



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25<sup>th</sup> July, 2011


DECLARATION

I do hereby declare that the dissertation titled “REGIONAL VARIATIONS IN THE DISTRIBUTION AND GROWTH OF FARM CREDIT IN INDIA” submitted by me is a bonafide work and it has not been submitted to any other university for the award of any other degree.


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*Dedicated to*  
*My Mother Shahnaz Bano*

## **Acknowledgement**

I express my immense gratitude to my supervisor Dr. Seema Bathla for her invaluable guidance, motivation and encouragement to complete this dissertation. I consider myself privileged to have worked under her supervision. Without her continuous support and constructive suggestions, this work would not have been possible. Her helpful criticism, suggestions, meticulous reading and editing, constant encouragement, and overall moral support made it possible for me to complete this dissertation and to see the light of the day.

I am also thankful to Prof. A. Kundu, Dr. Atul Sood and Dr. Himanshu for their useful comments and suggestions as members of my advisory board.

If words can reflect the depth of my inner feelings then I would be able to thank my friends enough. I immensely benefited from their friendship one way or other. They helped me in learning many things in my life whether it is in studies or in improving my personality. They are my biggest assets. I am very thankful to my friends especially my JNU friends Santosh Kumar Verma, Apparao Kasa, Gaurav Arya, Balkrishnan Negi, Awadhesh Kumar, Nahid Siddiqee, Ruchika Rani, Mohammad Khalid, Nitu Jaiswal, Mohammad Ansar, Promila Dhram, Nitin Gayakwad, M.A friends, Anayatullah Niyazi, Abu Obaid, Arfa Khan, Geetika Gunjan, intermediate friends, Swaminath Vishwakarma, Jitendra, Nadeem Ahmad, Abu Zaid, and child friends, Mohammad Akmal, Mohammad Afzal, Shadab Ahmad, Mohammad Arif, and Abu Saleh for multiplying my joys and dividing my sorrows. The ever-encouraging support, cooperation and understanding provided by seniors Ammanullah, Mohammad Talha, Satya Narayan are gratefully acknowledged. The sincere support and inspiration provided by them pushed me to complete the present piece of work.

This dissertation work could only be possible by the grace of Almighty *Allah* and blessings of people around me. The love, affection and undoubting support provided by my parents were constant inspiration to reach this stage in my life. The strong faith of my *Walid* who used to motivate me and his constant threats to make me join farming at my village in case of failure in any class led me with necessary zest to move on. It is my great pleasure

to acknowledge my mother Shahnaz Bano, for her love, emotional support and motivation. I am greatly indebted and thankful to my elder brother Abuzar and Abu Obaid for their support and encouragement. I am also thankful to my Brother-in-law, Mohammad Akram, Seraj Ahmad and Tyyab Khan for their emotional support and encouragement at each and every stage.

Last but not least I express my profound gratitude to my family members given me more encouragement and support than I could ever ask for. The financial assistance and research fellowship provided by University Grants Commission (U.G.C), Govt. of India, New Delhi is gratefully acknowledged.

Abu Huzaifa

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## **Abbreviations and Acronyms**

|        |   |
|--------|---|
| AG_GDP | GDP from Agriculture and Allied Activities                                    |
| ANFC   | Area under Non-food Crops   |
| CAGR   | Compound Annual Growth Rate   |
| CBs    | Commercial Banks  |
| CV     | Coefficient of Variation  |
| DEA    | Data envelopment analysis   |
| FAO    | Food and Agriculture Organisation   |
| FC     | Consumption of Fertilizers per Hectare  |
| DW     | Durbin-Watson Statistics  |
| DW*    | Transformed DW Statistics   |
| GCA    | Gross Cropped Area  |
| GFCF   | Gross Fixed Capital Formation in Agriculture                                  |
| HYV    | High Yielding Varieties   |
| II     | Irrigation intensity or Percentage of Net Sown Area to the Gross Cropped Area |
| IIT    | Index of Terms of Trade between Agricultural and Non-Agricultural Sectors     |
| LDBs   | Land Development Banks  |
| NPAs   | Non-Performing Assets   |
| NSA    | Net Sown Area   |
| NSS    | National Sample Survey  |
| OLS    | Ordinary Least Square   |
| PHC    | Agriculture Credit per Hectare of Net Sown Area                               |

|      |                                |
|------|--------------------------------|
| PACs | Primary Agricultural Societies |
| P-W  | Prains Winstern Transformation |
| RBI  | Reserve Bank of India          |
| RRBs | Regional Rural Banks           |
| SCBs | Scheduled Commercial Banks     |
| SD   | Standard Deviation             |
| VRS  | Variable Returns to Scale      |

## Chapter 1

### 1.1. Introduction:

Since the introduction of Green Revolution in India, there has been a growing tendency among the farmers to replace the traditional farming with scientific and modern techniques which includes the use of improved seeds, fertilizers and irrigation facilities. These inputs involve heavy financial investment which a majority cannot afford from their own savings and depend on credit. In the initial stages, agricultural credit was being provided by non-institutional sources like money lenders, traders, relatives' etc. Due to the exploitative nature of non-intuitional sources, the formal banking system was encouraged and entered the rural market at a rapid pace. Credit is thus considered to be one of the important inputs for the development of agriculture. The role of credit in agriculture has been pointed out by many economists. Lewis (1957) wrote, "farmers need much more capital than they can afford to save". Higgins (1959) marked, "Credit may be necessary for expansion in some areas, especially small agriculture and small industry". Leibenstein (1957) observed that, "if capital and labour, entrepreneurial facilities, technical knowledge, and credit facilities increase, the income per head will rise". Thus among the various factors that govern the pace of agricultural development, credit is one of them.

However, the limited role of credit in development of agriculture has arisen due to extreme uncertainty associated with agricultural production and marketing. By and large the issue has been settled by making distinction between traditional and modern agriculture. There are fundamental structural differences which have been found in the nature of agriculture of developed and developing countries. In the developed countries, the farmers are becoming more and more entrepreneur whose approach to production does not essentially differ from that of industrialist (FAO, 1971). Their approach to agriculture is totally profit oriented. But the nature of agriculture in developing countries is more or less traditional. Traditional agriculture is characterised by subsistence farming in which the extended family provides as much as possible for its direct needs of food and in particular for food grains. Since the entire energy of farming community is diverted for the production of food grains. It is a logical that farmers are less market oriented and lack of enthusiasm to raise cash crops. Thus it can be said that agriculture is a way of life in developing countries.

## 1.2: Role of Credit in Traditional Agriculture

The role of credit in traditional agriculture is quite different from its role in modern agriculture. Therefore, there is a need to understand the characteristics of traditional agriculture. The traditional agriculture is defined as subsistence farming in which production activities took place for the means of consumption. Regarding the nature of subsistence agriculture, Food and Agriculture Organisation observed that the traditional agricultural practices were the result of social factors which were established over centuries. For them, “agriculture production is the variable factor determined by family needs which in turn depends on the tradition and the varying extent of composition of family”. Thus FAO focuses on the social characteristics of traditional agriculture. On the other hand, Prof. Schultz (1970) explained that the production behaviour of farmers is bound by the traditional agriculture. He observed that farmers are efficient but the marginal rate of return to investment in traditional inputs is so slow that they have little incentive to save and invest. The traditional agriculture can also be characterised in terms of production relation. It is pre-capitalist because of very nature of production. The main features of the capitalist production are : 1) surplus extracted through extra economic coercion of unfree labor; 2) surplus appropriated directly without intervention of any market; 3) surplus dissipated in luxury consumption and different unproductive investment, leaving the stock of productive capital unchanged and production in a cycle of simple reproduction; 4) technology remains unchanged( Rudra, 1982).

There are three groups of economists who have elaborated the characteristics of traditional agriculture. The first group explains the cultural characteristics of traditional agriculture. Prof Hansen wrote in the case of India “agriculture practices are controlled by custom and tradition” (Swain, 1989). It can be said that the traditional cultural values existing in the farming community dominates agriculture. The second group of economists explains economic interpretation of traditional agriculture. It is based on Shultzian model of “efficient but poor economy” which propounded that in traditional agriculture capital is not significant constraint on the output of small farmers. To Shultz, resource allocation in this type of agriculture is efficient with the existing state of art. According to this “efficient but poor” hypothesis, the community is poor because the factor on which the economy is dependent is incapable of producing more under existing circumstances. It is argued

that, farmers have gradually to involve in efficient organisation with comparatively inactive levels of technology, physical condition and resource costs (Mellor, 1976). In the absence of new technology, there will be no motivation for new investment and agricultural credit in traditional agriculture.

The third group of economists focussed on the “relation of the production”. According to them, it is the indebtedness among the farming community which led to technologically motionless and non-credit enthusiasm in agriculture. The third group explains semi-feudal or pre-capitalist characteristics of traditional agriculture which act as stumbling block to the release of productive factors and to the development of agriculture on capitalist lines. In the mid fifties it was observed that the semi-feudal mode of production in India acted as a ‘built –in depressor’ that inhibits technical change and growth in agriculture (Patnaik, 1986). To make productive investment on capitalist lines, the productivity raising new technologies should be introduced that will bring quantum jump in the yield and surplus per unit of area and overcome the rent barrier. Thus what is required is not state sponsored expansion of rural credit, but a land augmenting technological progress associated with fertilizer-fed hybrid seeds and controlled irrigation facilities to increase productivity per unit of area. Once new technology is introduced and new inputs are made available to the market, credit will play a significant role in increasing agriculture productivity

On the other hand, lack of market for farm products leads to involuntary exchange. Non-legalised share cropping is also a major constraint in transforming traditional agriculture into modern one. Thus traditional agriculture is basically a technologically motionless phase in which attempted changes usually produced small increase in the production. In the absence of the new technique, any injection of credit will be used primarily to finance non-productive expenditure.

It is also emphasised that credit can be a catalyst to transform traditional agriculture into the state of developed and modernised agriculture. Now, it has been realised that credit has limited role in the transformation of traditional agriculture in the absence of the use modern inputs. In the initial stage of development, credit has consumptive character. There are so many factors which are accountable for this i.e. subsistence nature of farming, inadequate food resources, crop failure, and traditional custom of rural life which often involve heavy expenditure for religious and social ceremonies.

As it is already explained in the Shultzian a model of “efficient but poor economy” the resource allocation is efficient in agriculture in the given circumstances. It is the absence of modern techniques which led to no motivation of investment. As a result credit will be used for non-productive purpose. So long as the production function shifted through technological change, the motivation will increase to use agricultural credit for the productive purpose.

### **1.3. Role of Credit in Modern Agriculture**

In modern agriculture, agricultural sector becomes fully commercialised and the farmer produces for the market with profit motive. It is the new technology and availability of new inputs that can transform traditional agriculture into modernised one. The new technology may be divided into two categories. One is depending on the chemical sources of energy and other one on mechanical sources of energy. Biochemical technology is “land augmenting” and “labour absorbing” in nature. It is based on the traditional element along with sufficient use of irrigation, fertilizers and HYV seeds. It is appropriate for labour surplus country like India as it absorbs more human labour. Mechanical technology is labour displacing in nature, displaces human and animal labour and make use of machines like tractors, threshers etc. Thus the land augmenting technique has no size bias whereas mechanical technology has a size bias.

To adopt any one of them, the farmers will be needed sufficient amount of cash. With the existence of narrow resource base and saving potential in the farming community, the supply of outside finance becomes absolutely essential. In such situation the credit institution can play a dynamic role in modernising agriculture and increasing productivity. Agricultural credit shows a dynamic character when major portion of it is utilised for financing technological package. For the successful implementation of any agricultural credit projects, certain condition must be fulfilled such as the provisions of remunerative prices, proper marketing facilities, creation of infrastructure, availability of new inputs, proper economic planning and extensive services, and proper system of land tenure. Credit programmes would be failure even under the new technology where farmers have no security of tenure. Finally land reforms are necessary not for increasing productivity but also for equity consideration. In the absence of requisite land reforms, a government supported credit programs will help in subsidizing big land owners at the expense of small farmers.



Historically, agriculture has been the main stay of the Indian Economy. The entire British Empire was maintained and financed by the surplus generated from agriculture. Upto mid sixties, the nature of Indian agriculture was predominantly traditional with a colonial system of administration and exploitation. The institutional pattern in agriculture was not conducive for modernisation. Due to lack of employment opportunities in other sector, there was a tremendous pressure on agricultural land. Furthermore, the skewed distribution of land created a vast army of small and marginal farmers and landless labourer. Due to presence of feudal mode of production, the landlords were exploiting through the supply of usurious capital.

However, credit was an important input even in the traditional agriculture. Farmers may use some amount of medium term and long term credit to finance cultivation tools, wells and irrigation devices, land improvement and working animals. Crops failure brought about immediate need of medium and long term credit. The high interest rate imposed on the loans led to debt burden, which in turn lead to the loss of the land and other assets. Overdependence of farmers on landlords-cum moneylenders and moneylenders-cum- traders and diversion of credit for consumption purpose aggregates the poverty of the farmers and the state of Indian agriculture (Bhagaban, 1989). The evils associated with the credit from these money lenders compelled the government to introduce legislation to drive them out of business and free the agriculturist from their clutches.

In India, institutional credit for agriculture was viewed from the angle of protecting farmers from the grip of money lenders. It was hardly considered as an instrument of production enhancement. Traditionally the role of agricultural credit is of giving push to development process. An introduction of the Green Revolution in 1966 is being considered as transformation of Indian agriculture from traditional to modern one. The period of post Green revolution has been classified into three sub-periods, namely, 1962-65 to 1980-83 (the initial period of Green Revolution), from 1980-83 to 1990-93 (maturing of Green Revolution), and the post-reform period from 1990-93 to 2003-06 (Bhalla and Singh, 2009). Indian agriculture has witnessed a major technological-break-through and progressive commercialisation. With the modernisation of agriculture in the mid 60s, the demand for short term and long term agricultural credit started rising at a rapid rate as the farmer has to purchase costly inputs like fertilizers, HYV seeds, pesticides, seeds from the market. Capital, together

with scientific knowledge, played a very significant role in increasing the productivity of agriculture. This had shifted the government attention from cooperative based approach to state owned banks to create an alternative source of finance to free the farmers from the grip of money lenders. The development of institutional credit market can be explained through four phases.

#### **1.4. Evolution of Formal Banking System in India**

##### **1.4.1: Phase 1(1904-1969)**

*“The practice of extending institutional credit to agriculture can be traced back to the colonial period of early 1970s when farmers were provided with such credit by the Government during drought years. Thinking to do with credit cooperation began in the latter part of the nineteenth century. The early years of the twentieth century were characterised by continuous official attention to the provision of rural credit: a new Act was passed in 1912 giving legal recognition to credit societies and the like (a precursor of micro-finance); the Maclagan Committee on Cooperation in India issued a report in 1915 advocating the establishment of provincial cooperative banks, which got established in almost all provinces by 1930 thus giving rise to the 3-tier cooperative credit structure; the Royal Commission on Agriculture further examined the program of rural credit in 1926-27; Sir Malcolm Darling submitted another report on cooperative credit to the Government of India in 1935, just before the founding of the Reserve Bank of India” ( Mohan, 2004).*

The first landmark in the development of institutional credit market was the passing of the Cooperative Credit Act of 1904 and 1912. The Primary Agriculture Credit Societies were established in 1904 to provide mainly short term and medium term loan to the borrowers to finance current inputs. Another important step was the passing of the RBI Act 1934. Districts Central Bank and Land Development Bank as a powerful alternative agency had come into being and credit became available to agriculture at a reasonable rates.

The Rural Banking Enquiry Committee (Thakurdas Committee, 1950) stressed the importance, of an efficient system of agricultural finance, of a sound co-operative credit structure capable of developing close relations with the Bank. The Reserve Bank followed up the Rural Banking Enquiry Committee with the informal

conference. Following the conference's recommendation, the Reserve Bank decided to organise a Rural Credit Survey and constitute a Standing Advisory Committee on Agricultural Credit.

The All-India Rural Credit Survey, commissioned in August 1951, brought about the utter insignificance of co-operatives in providing rural credit. It had emphasised 'positive and deliberate' measures rather than 'small administrative, functional or other changes' to ensure the success of co-operative credit institutions and enable them to become self-supporting. The State's tendency in the past had been to 'over-administer and under - finance' the co-operative movement, but the Report pointed out the need for an integrated system of co-operation and rural credit. The Report envisaged a key role for the Reserve Bank of India in coordinating the proposed network of co-operative institutions and for its Agricultural Credit Department in overseeing their functioning. The Reserve Bank would occupy a 'strategic position' in the co-operative credit sector, while other principal participants would play a major role in rural co-operation, *viz.*, co-operative economic activity and the training of co-operative personnel (Chakrabarty, 2003).

The State Bank of India was created in July 1955 in order to give a boost to direct flow of funds of the banking system into certain neglected, but important sectors of the economy such as agriculture and allied activities and spread banking facilities in rural areas. The flow of funds to the rural sector increased over the years. The High-Yielding Varieties Programme (or HYVP) was also launched during Kharif 1966-67, as part of the new agricultural strategy towards achieving self-sufficiency in food by 1970-71. Due to cultivators' resistance to the new practices, lack of proper motivation and orientation amongst extension staff, the demand for credit was poor.

In July 1966, the All India Rural Credit Review Committee (Venkatappiah Committee) was formed. The adoption of the multi-agency approach as the most feasible and appropriate response to the credit requirements of agriculture and allied activities was recommended. After a comprehensive review, the Committee recommended that the commercial banks should play a complementary role, along with co-operatives, in extending rural credit. The social control and the subsequent nationalisation of major commercial banks in 1969 (and in 1980) acted as a catalyst in

providing momentum to the efforts of leveraging the commercial banking system for extending agricultural credit (Moahan,2004).

#### **1.4.2. Phase 2 (1969-1975)**

The concept of priority sector had been introduced in this phase in order to underscore the imperative of financing certain neglected sectors like agriculture. The nationalisation of the 14 major commercial banks in July 1969 helped the orientation of commercial banks lending policies and procedures to meet the requirements of the priority sectors of the economy with due attention to the financial needs of the small farmers. Decentralised credit planning through the Lead Bank Scheme was also introduced, under which, each district was placed with one of the commercial banks (called the district Lead Bank) to spearhead the credit allocation for, *inter alia*, agricultural lending. It has improved the flow of funds to agriculture sector through the organised credit channels. Agriculture sector got the place of importance in the priority sector lending<sup>1</sup>. During the second phase, the commercial banks were *inter-alia* also assigned a role in providing agricultural credit to supplement credit by cooperatives. With social control of banking, the commercial banks enjoyed to lend 18% of their total credit to agriculture as a priority sectors.

#### **1.4.3. Phase 3 (1975-1991)**

In the third phase the RRBs were established to provide credit to small and marginal farmers and weaker section of societies. Initially five RRBs were set up, i.e. at Moradabad and Gorakhpur(U.P), Bhiwani (Haryana), Jaipur(Rajasthan) and Malda(W.B), each with an authorised capital of one crore, and issued capital and paid up capital of 25 lakhs. By mid-1977, the scheme of financing primary agricultural credit societies was also come into operation in 12 States, 24 commercial banks through 604 branches had taken over 343 societies for financing, however, over the years, it was found that the experience with the working of the scheme was in general not satisfactory.

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<sup>1</sup> At present, scheduled commercial banks (excluding RRBs), are expected to ensure that the priority sector advances constitute 40 per cent of net bank credit and within the overall lending target of 40 per cent, 18 per cent of net bank credit goes to agricultural sector. To ensure that the focus of banks on direct category of agricultural advances does not get diluted, lendings under indirect category should not exceed one-fourth of the agricultural sub-target of 18 per cent, *i.e.*, 4.5 per cent of net bank credit.

In the context of the large finance gap, the commercial banks, Regional Rural Banks (RRBs) and co-operatives were deeply concerned during late 1970s. The system of district credit plans was introduced to meet the credit needs by different agencies. The commercial banks were geared up to fulfil priority sector targets and the target was raised to 40 per cent of their outstanding advances by March 1985. Another target was the attainment of 60 per cent of credit deposit ratio by the banks by March 1985 in respect of rural and semi-urban branches separately.

The Reserve Bank of India appointed a Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development, chaired by B. Sivaram, former Secretary of the Ministry of Agriculture, and Government of India in 1979. The report was submitted in 1981 and recommended the setting up of a National Bank for Agriculture and Rural Development (NABARD). All major rural credit related works from the Reserve Bank of India were shifted to the NABARD. Its three main functions are development, credit and supervision (NABARD undertakes supervision function in respect of RRBs, SCBs and DCCBs on behalf of the RBI). The development includes activities which ultimately enhance credit absorption, capacity building awareness and allow policy advocacy for various causes. Credit primarily covers refinancing of cooperatives, RRBs and commercial banks and finance for rural infrastructure and supervision. The other major steps in third phase were deregulation of interest rates, rehabilitation of cooperation evaluation cell.

Today 196 RRBs together cover 516 districts and serve a client base of close to 6.27 crores. The no of RRBs rose from just 5 in 1975 to 196 by 2004. The no of RRBs branches had increased over 14,000 covering 516 districts (Bhalla, 2006)

#### **1.4.4. Phase 4 (1991- onwards)**

Notwithstanding the impressive geographical spread, functional reach and consequent decline in the influence of informal sources of credit, rural financial institutions were characterised by several weaknesses, viz., decline in productivity and efficiency; erosion of repayment ethics and profitability (Mohan, 2004). In the fourth phase, the financial sector reforms were introduced. SCBs were assessing to deregulate interest rates. There was introduction of potential norms to reduce non-performing assets (NPAs).

Several committees/working groups/task forces had been formed to go through financial aspects of rural financial institutions. During the 1990s, the blueprint for carrying out overall financial sector reforms during 1990s reform had been provided by the Report of the Committee on the Financial System (Chairman: Shri M. Narasimham, 1991). Others which were looked at the above issues were “The High-level Committee on Agricultural Credit through Commercial Banks” (R. V. Gupta, 1998), “Task Force to Study the Functions of Cooperative Credit System and to Suggest Measures for its Strengthening” (Jagdish Capoor, 1999), “Expert Committee on Rural Credit” (V.S. Vyas, 2001), and “The Working Group to Suggest Amendments in the Regional Rural Banks Act, 1976” (M.V.S. Chalapathi Rao, 2002). These committees/working groups/task forces made far-reaching recommendations having a bearing on agricultural credit.

In spite of suggesting diversification of the business of RRBs, the Chalapathi Rao Working Group (2002) had recommended introduction of capital adequacy norms for RRBs in a phased manner, along with the RRB-specific amount of equity based on the risk-weighted assets ratio. The financial sector reforms brought about various measures in the area of agricultural credit such as

- ❖ deregulation of interest rates of co-operatives, and RRBs;
- ❖ deregulation of lending rates of commercial banks for loans above Rs. 2 lakh; recapitalisation of selected RRBs;
- ❖ introduction of prudential accounting norms and provisioning requirements for all rural credit agencies;
- ❖ increased refinance support from RBI and capital contribution to NABARD;
- ❖ constitution of the Rural Infrastructure Development Fund (RIDF) in NABARD for infrastructure projects;
- ❖ Introduction of Kisan Credit Card (KCC) and stipulation of interest rate not exceeding 9 per cent for crop loans up to Rs.50, 000 extended by the public sector banks.

Various Committees have also been set up by the state and/or the Reserve Bank of India to look into the aspects of financial inclusion, farmer indebtedness, integrating moneylenders with the mainstream market and farmer distress. According to Economic Survey 2011, Indian Economy has done very well on growth in the recent

years but needs to focus on the peddle for ‘financial inclusion’...In order to achieve such inclusion, there are plans to expand India’s banking sectors, enable the creation of the new financial products and use modern technology to enable poor to keep their saving in interest earning accounts. One of the most ambitious schemes for achieving these is the Swabhimaan programme, which, takes off on the idea of financial inclusion proposed and developed in Rangrajan Committee Report (Committee on Financial Inclusion). Swabhimaan, launched on 10<sup>th</sup> February 2011, is an innovative scheme to take banks to the door step of the rural poor instead of latter having to go in search of banks (Economic Survey 2011, Chap 2, page 29-30).

### **1.5. Credit Disbursement and Agricultural Sector in India**

Since the nationalisation of banks, there has been a significant increase in the access of rural cultivators to institutional credit and, simultaneously, the role of informal agencies, including money lenders, as source of credit has declined. According to the All India Debt and Investment Survey 1991-92, the relative shares of institutional agencies in the total cash debt of rural cultivators increased from 31.7 per cent in 1971 to 63.2 per cent in 1981 and further to 66.3 per cent in 1991.

On the other hand, there has been decreasing share of agricultural credit in total credit in the recent years. What could be the reason behind this? It is quite clear from Table 1.1 that the percentage share of agricultural credit to total agriculture GDP increased over the period. The share of agricultural credit to total GDP has also increased till 1980s. Thus decline in the share of agricultural credit to total credit is because of less contribution of agriculture to total GDP. With the share of agriculture in GDP falling continuously, from 36 per cent in 1981 to 29 per cent in 1991 and 22 per cent in 2001, it is to be expected that the share of agricultural credit would also fall as a proportion of total credit, unless this trend is corrected by increasing commercialisation of agriculture.

**Table 1.1: Ratio of Direct Agricultural Credit (Disbursements) to Agricultural Gross Domestic Product (GDP), Total GDP and Total Credit (in Percent)**

|         | Agricultural Credit/<br>Agriculture GDP | Agricultural Credit/<br>Total GDP | Agricultural Credit/<br>Total Credit |
|---------|---|-----------------------------------|--------------------------------------|
| 1950-51 | 0.5                                     | 0.3                               | n.a                                  |
| 1960-61 | 3.3                                     | 1.3                               | n.a.                                 |
| 1970s   | 5.4                                     | 2.1                               | 10.8                                 |
| 1980s   | 8.3                                     | 2.6                               | 8.5                                  |
| 1990s   | 7.4                                     | 2                                 | 6.4                                  |
| 2001-02 | 8.7                                     | 2                                 | 5.5                                  |

*Source:* Reserve Bank of India Bulletin, 2004, page 5

*Note:* 1. *Agricultural Credit:* Direct credit for agricultural and allied activities extended by Co-operatives, Commercial Banks and Regional Rural Banks.

2. *Total GDP and Agricultural GDP* are at factor cost and at current prices.

3. *CS - Other banks' credit to commercial sector (outstanding)* proxy for total credit.

**Table 1.2: Decadal Average Share of Institutions in Direct Agricultural Credit (Disbursements)**

|              | Co-<br>operatives | RRBs       | CBs       |
|--------------|-------------------|------------|-----------|
| <b>1970s</b> | <b>79.5</b>       | <b>2.3</b> | <b>21</b> |
| 1980s        | 55.9              | 5.3        | 38.9      |
| 1990s        | 51.5              | 6.2        | 42.3      |
| 2001-02      | 44                | 11         | 45        |

*Source:* Handbook of Statistics on Indian Economy: 2002-03.

At the time of nationalisation in June 1969, the total number of rural offices of scheduled commercial banks (SCBs) was 1,833, which then increased significantly to 32,406 by March 2003. The number of co-operative institutions catering to agriculture went up from 95,871 in end- June 1980 to over 1, 10,000 at present. The share of the rural branches of scheduled commercial banks (including RRBs) in total increased sharply from 22 per cent in June 1969 to 47 per cent by March 2003(Mohan, 2004). The main story in the expansion of rural credit in the 1980s and 1990s can be supported by an increase in the share of commercial banks, along with RRBs, with a corresponding fall in the share of non-institutional sources (Table 1.2). But the pace of agricultural credit through institutional sources could not maintain in the reform period, indicated by increase in the share of non-institutional sources. There is some evidence to the contrary. Available data suggest that agricultural credit has been rising



in recent years as a share of both the value of inputs and the value of output (Table 1.3). Thus, it is probably fair to say that the agricultural credit effort has not really been slackening in the 1990s.

**Table 1.3: Gross Value of Outputs, Value of Inputs and Short-Term Credit**  
(Rupees Crore at 1993-94 prices))

| Year    | Gross Value of Output | Value of Input | Short-term Credit | Short-term credit as Percentage of |                 |
|---------|-----------------------|----------------|-------------------|------------------------------------|-----------------|
|         |                       |                |                   | Value of Input                     | value of Output |
| 1993-94 | 2,04,874              | 27,413         | 9,752             | 35.6                               | 4.8             |
| 1996-97 | 2,32,833              | 30,735         | 13,330            | 43.4                               | 5.7             |
| 1998-99 | 2,45,413              | 34,566         | 14,642            | 42.4                               | 6               |

Source: RBI Bulletin, November 2004, page 7.

**Table 1.4: Region-wise Share of Agriculture and Allied Sector Credit**  
(Short Term and Long Term) Disbursements (in percent)

| Region        | 1990-91     | 1995-96   | 2001-02     |
|---------------|-------------|-----------|-------------|
| Northern      | 12.9        | 11.6      | 19.9        |
| North-Eastern | 0.4         | 0.4       | 0.5         |
| Eastern       | 8.3         | 6.4       | 7.4         |
| Central       | 16.9        | 16.4      | 14.1        |
| Western       | 13.6        | 17.1      | 14.4        |
| Southern      | <b>47.9</b> | <b>48</b> | <b>43.8</b> |
| All-India     | 100         | 100       | 100         |

Source: Reserve Bank of India.

At the regional level the results seem to be unsatisfactory, the share of Southern region in agricultural credit remains higher in the reform period. There was 47.9 percent share of southern region in total agricultural credit in the year 1990-91 followed by Central region (16.9 percent), Western Region (13.6 percent), Northern Region (12.9). The share of Southern region declines to 43.8 percent in the year 2001-02 (Table 1.4).

It is obvious from the Table 1.5 the compound annual growth rate (CAGR) of total outstanding in the pre-reform period 16.83 percent whereas in the first ten year of the reform period it has showed negative growth rate. In the period 2000-03 to 2005-08 the CAGR of total outstanding was 6.29 percent. The same trend has also been seen at the individual level of three institutional sources of credit. The total outstanding of RRBs in the pre reform period registered 25.49 percent CAGR followed by SCBs with 20.93% and cooperatives with the lowest 12.43 percent. In the post reform period all three registered negative growth rate. Due to revival of institutional credit, in the period of 2000-03 to 2005-08 the CAGR of RRBs outstanding again showed highest 7.99 percent followed by 7.2 percent by SCBs and 5.06 percent by cooperatives. The target of agricultural credit flow for the year 2009-10 was fixed at 3, 25,000 crore and the achievement as on March, 2010 is Rs 3, 66,919 crore forming 113 percent of the target. The target for credit flow for 2010-11 is Rs 3, 75,000 crore (India Year Book 2011, GOI pg 80).

| <b>Table 1.5: Compound Annual Growth of Loan Outstanding</b> |                           |                           |                           |
|--|---------------------------|---------------------------|---------------------------|
|  | <b>1980-83 to 1990-93</b> | <b>1990-93 to 2000-03</b> | <b>2000-03 to 2005-08</b> |
| <b>Cooperatives</b>  | 12.43                     | -4.43                     | 5.06                      |
| <b>SCBs</b>  | 20.93                     | -6.00                     | 7.20                      |
| <b>RRBs</b>  | 25.49                     | -6.56                     | 7.99                      |
| <b>Total</b>   | 16.83                     | -5.35                     | 6.29                      |

*Source: Calculated from RBI Report*

### **1.6: Justification of the Study**

The share of institutional sources in total loan outstanding has increased up to 1980s. But in the reform period the share of institutional sources declined. So there is a need to study changes in the relative role of institutional and non-institutional sources of loan outstanding across the states. The highly skewed distribution of institutional credit in favour of relative progressive regions and better off section of agriculture population is likely to generate strong backwash effects, thereby retarding the overall pace of agriculture development. So a study is needed, to get more egalitarian credit plan to maintain the rapid and balanced agriculture development of the country. With the passage of time, Indian agriculture has also been commercialised and the farmer has to purchase costly inputs like fertilizers, tractors, pump sets from the market to produce more. The agricultural credit as a means to buy these modern inputs,

indirectly affects the production process. So a research must be carried out to analyse the relationship between agricultural credit and these inputs.

### **1.7: Objectives of the Study**

- To study the relative role of institutional and non-institutional sources of credit across the states and analyse changes there in during 1981, 1992 and 2002.
- To examine the extent of regional variations and growth in farm credit by Commercial Banks (CBs), Regional Rural Banks (RRBs) and Cooperatives from 1981 to 2008, broadly representing the pre and post reform periods
- To identify the determinants of agricultural credit given by institutional sources in each state from 1981 to 2008
- To see the impact of farm credit on gross domestic product (GDP) in agriculture

### **1.8: Hypotheses:**

H1: Credit from institutional sources to agriculture has improved across the states.

H2: Regional disparities in the distribution of credit by Commercial Banks (CBs), Regional Rural Banks (RRBs) and Cooperatives have increased from 1981 to 2008.

H3: Agricultural credit is positively influenced by the use of farm inputs.

H4: Agricultural credit has a positive impact on GDP in agriculture and allied activities

### **1.9: Data Sources and Methodology**

The analysis in the study is undertaken for seventeen major states viz. Andhra Pradesh, Assam, Bihar (undivided), Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh (undivided), Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh (undivided), West Bengal, Jammu & Kashmir and Himachal Pradesh. These states account for more than 95 per cent of the population and 93 per cent of the Net Domestic Product (NDP) in the country (see, Rao, 1999). In addition to this, these

states have been contributing, on an average, 90 per cent of the total deposits in the country through Scheduled Commercial Banks (SCBs) including RRB for the last twenty years. Out of the total agricultural credit provided in the country through SCBs and RRBs, on an average, 96 per cent of it goes to these states (RBI, various years).

In order to study the relative role the institutional and non-institutional sources of credit, state-wise and source-wise data on loan outstanding has been collected from the Reports on 37<sup>th</sup> , 48<sup>th</sup> and 59<sup>th</sup> Rounds of the National Sample Survey (NSS) pertaining to the years of 1981,1991 and 2002. For the purpose of the study, a comparative analysis of three rounds of the data which shows source wise and state-wise distribution of credit has been attempted. The data for undertaking analysis at all India and state-level were collected from the Report on Currency and Finance (RBI), Banking Statistics (RBI), Fertiliser Statistics (the Fertiliser Association of India), Indian Agricultural Statistics (Ministry of Agriculture, Government of India) and Statistical Abstract (Central Statistical Organisation, Department of Statistics and Programme Implementation, Government of India). The data related to Cooperative Credit Societies has been obtained from the Statistical Statement Relating to Cooperative Movement, NABARD. The study is based on agricultural credit distributed by the Scheduled Commercial Banks to agricultural sector. The Scheduled Commercial Banks consist of State Bank of India and its Associates, Nationalised Banks, Foreign Banks, Regional Rural Banks and Other Scheduled Commercial Banks. To examine the extent of inequality in the supply of credit, coefficient of variation is used in the following form:

$$\text{Co-efficient of Variation (CV)} = \text{Standard Deviation (SD)} / \text{Mean}$$

Availability of credit per hectare (Net Sown Area) has been taken as an indicator of supply of credit. The selection of variables which determines the supply of agricultural credit is guided by earlier studies and economic theory. The study is based on time series and cross sectional data on loan outstanding by the RRBs, commercial banks, co-operatives to the farm sector. The study has been divided into three sub-periods 1981-81 to 1990-91 (pre reform period), 1991-92 to 1999-2001 (reform period slow down in the growth of agricultural credit) and 2000-01 to 2007-08 (reversal in the growth of agricultural credit). State-wise annual growth rate of

institutional credit has been calculated for each period. In order to work out the growth rate, the semi-log model is used in the following form:

$$\ln Y_t = \beta_1 + \beta_2 t + u_t$$

Where,  $t$  is the time period,  $\beta_1$  and  $\beta_2$  are parameters, and  $u_t$  is the disturbance term. After estimating the above regression model, annual average growth rate (over a period of time) has been calculated by the following way, viz, Annual Average Growth Rate = (Antilog of the estimated  $\beta_2 - 1$ ) \* 100.

To find out the determinants of agricultural credit, data related to consumption of fertilizers, gross cropped area, net sown area and percentage of area under non-food crops has been collected from the various issues of Fertilizers Statistics published by the Fertilizer Association of India. Other data related to agriculture has been collected from the Agriculture Statistics, Ministry of Agriculture. Statistical techniques such as correlation is used to see the association of agricultural credit per hectare with consumption of fertilizers per hectare, cropping intensity (percentage of gross cropped area to net sown area), irrigation intensity and percentage of area under non-food grains. Log linear regression analysis has been used to see the effect of explanatory variables (consumption of fertilizer per hectare, cropping intensity, irrigation intensity and percentage of area under non-food crops) on agricultural credit per hectare. The following functional form is used:

$$\ln Y = \beta_0 + \beta_1 \ln X + \beta_2 D + u \dots \dots \dots (1.1)$$

Where  $\ln Y$  = natural logarithm of the agricultural loans in Rupees per hectare.

$\ln X$  = natural logarithm of the explanatory variables taken in the study.

$D = 1$  if the year 1991, 1992.....2008(Post –reform period).

$= 0$  other-wise

In order to avoid multi-collinearity problem, a few variables are dropped. Alternative equations are tried. The functional form of the equation is:

$$\ln PHC = \beta_0 + \beta_1 \ln CI + \beta_2 \ln ANFC + \beta_3 \ln II + \beta_4 \ln FC + u \dots \dots (1.2)$$

Where

lnPHC = natural logarithm of dependent variable which is the per hectare credit (PHC) supplied by the SCBs, RRBs and Cooperatives (at 1999-2000 prices).

While lnCI = natural logarithm of cropping intensity (CI)

lnANFC = natural logarithm of the cropping pattern measured by Percentage of area under non-food crops (ANFC)

lnII = natural logarithm of percentage of gross irrigated area to the gross cropped area or irrigation intensity (II)

lnFC = natural logarithm of consumption of fertilizers per gross cropped area (in Kg PH).

$\beta_1, \beta_2, \beta_3, \beta_4$  are their respective slope coefficient,  $\beta_0$  is intercept and  $u$  is the error term.

Prais-Winsten transformation regression has been used to avoid the problem of autocorrelation which exist in most of the time series data. Prais-Winsten estimation is procedures which take care of serial correlation of type AR (1) in a linear model. It is an improvement to the original Cochrane-Orcutt algorithm for estimating time series regressions in the presence of auto-correlated errors. The main advantage of using Prais-Winsten(P-W) over the Cochrane-Orcutt estimation is that it does not lose the first observation, thereby leading more efficiency in the estimation of coefficient.

Let us consider the following model

$$Y_t = \beta_1 + \beta_2 X_t + \varepsilon_t \dots\dots\dots(1.3)$$

where  $Y_t$  is the time series of loan outstanding per hectare at time  $t$ ,  $\beta$  is a vector of coefficients,  $X_t$  is a matrix of explanatory variables, and  $\varepsilon_t$  is the error term. The error term can be serially correlated over time:  $\varepsilon_t = \rho\varepsilon_{t-1} + e_t$ ,  $|\rho| < 1$  and  $e_t$  is a white noise. The OLS method can be applied here to examine the impact of the above on the credit flow to agriculture by the SCBs. However, as per the Durbin-Watson “d” test a positive auto correlation was observed in the estimation. The Cochrane-Orcutt method can be depicted in the following form

$$\ln(Y_t - \rho Y_{t-1}) = \beta_0(1 - \rho) + \beta \ln(X_t - \rho X_{t-1}) + e_t \dots (1.4)$$

Where, t and t-1 shows the current and lagged value of the variable, respectively. It can be used for t=2, 3, T, Prais-Winsten procedure which is preferred over C-O regression makes a reasonable transformation for t=1 in the following form:

$$\sqrt{1 - \rho} \ln Y_t = \sqrt{1 - \rho} \beta_0 + \sqrt{1 - \rho} \ln \beta_1 X_t + \sqrt{1 - \rho} \epsilon_t \dots \dots \dots (1.5)$$

Since the analysis is across the states for a longer time period, along with simple multiple regression, a panel regression analysis (fixed effect and random effect techniques) has also been used, mainly to enrich the analysis. In this model, the individual effect is assumed to be constant over time and specific to the individual states. Hence, differences across the states can be captured in differences in the constant term using  $\ln Y_{it} = \beta_0 + \beta_1 \ln X_{it} + u_{it}$ . Where i stand for the *i*th cross sectional unit which is 17 major states and t denote *t*th time period. There are k regressors in  $X_{it}$  excluding the constant term. The individual effect,  $\beta_0$  is taken to be constant over time t and specific to the individual cross sectional units i. The Fixed Effect approach and Random Effect takes  $\beta_0$ , to be a group specific constant and group-specific disturbance term in the regression model, respectively

$$\ln \text{PHC} = \beta_0 + \beta_1 \ln(\text{CI})_{it} + \beta_2 \ln(\text{ANFC})_{it} + \beta_3 \ln(\text{II})_{it} + \beta_4 \ln(\text{FC})_{it} + u_{it}$$

In order to see the association of agricultural credit with agricultural gross state domestic product (GSDP), the analysis is done at all India level. Other macro variables like gross cropped area (GCA), gross fixed capital formation in agriculture (GFCF) and index of terms of trade between agricultural and non-agricultural sectors are used as explanatory variables. The data on GSDP and GFCF has been obtained from Central Statistical Organisation (CSO), National Accounts Statistics. Index of terms of trade is taken from Ministry of agriculture, Agricultural Statistics at a Glance. Due to non-availability of data on public and private investment at the state-level, the analysis is done only at the national level. The functional form of the equation:

$$\ln AG\_GDP = \beta_0 + \beta_1 \ln PHC + \beta_2 \ln GCA + \beta_3 \ln GFCF + \beta_4 ITT + u \dots \quad (1.6)$$

Where

$\ln AG\_GDP$  = natural logarithm of dependent variable which is the agricultural GDP (at 1999-2000 prices).

While  $\ln PHC$  = natural logarithm of dependent variable which is the loan outstanding by CBs, RRBs and Cooperatives (at 1999-2000 prices).

$\ln GCA$  = natural logarithm of gross cropped area.

$\ln GFCF$  = natural logarithm of gross fixed capital formation in agriculture (at 1999-2000 prices).

$\ln ITT$  = natural logarithm of index of terms of trade<sup>2</sup> (at 1999-2000 prices) between agricultural and non-agricultural sectors.

### **1.10: Plan of Chapters**

The study contains five chapters.

#### **Chapter I:**

This chapter discuss the importance of credit in traditional and modern agriculture. It also deals with the objectives, data sources and methodology undertaken in the present analysis.

#### **Chapter II:**

The second chapter provides literature survey on issues of regional distribution of credit, the determinants of agricultural credit and examine the relationship between agricultural credit and growth.

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<sup>2</sup> Note: ITT is obtained by dividing Index of price paid (IPR) by the combined index, and multiplied by 100.



### **Chapter III:**

This chapter analyses the changes in the relative role of institutional and non-institutional sources of credit, and the regional variations in the distribution of farm credit.

### **Chapter IV:**

This chapter presents the analysis on the factors that influence credit flow to agricultural sector and the impact of agricultural credit on agricultural growth rate.

### **Chapter V:**

This chapter presents the major findings obtained from the study.



## **Chapter: 2**

### **Review of Literature**

A large number of studies have been done on agricultural credit highlighting various aspects. Some of these studies deal with the relationship between credit and agriculture growth while the others discuss credit in relation to new technology. Taking into the consideration of the objectives of the study, various aspects like regional dimension of agricultural credit, determinants of agricultural credit, relationship between agricultural credit and growth etc have been taken into account. A review of these studies has been done under three broad groups:

- ❖ Regional dimensions of agricultural credit and disparities
- ❖ Determinants of agricultural credit
- ❖ Relationship between agricultural credit and growth

#### **2.1: Regional Dimensions of Agricultural Credit and Disparities in India**

It is said that there are regional variations in the growth and distribution of agricultural credit. Besides, the role of non-institutional sources of credit changed over the period of time. The All India Rural Credit Survey (1954) conducted by RBI was the first major effort to assess the credit requirements of rural sectors and to examine the performance of existing credit institutions. The reference period of the survey was from November 1951 to July 1952. The Report revealed that 93 percent of agricultural credit was issued by the non-institutional agencies and the share of co-operative and Government together was about 6 percent. In the mean time, the Reserve Bank of India has constituted a Committee which recommended revamping the structure of co-operatives in such a way that it can play a major role in the supply of institutional credit to agriculture. But the Committee could not find the need and importance of bringing commercial banks into the field of agricultural credit. It also failed to give a formal analysis on the effect of introducing cooperatives upon the working of rural credit market.

It was the same Committee in 1969 which has recommended bringing about the commercial banks actively into the field agricultural credit. The Nationalisation of banks was the first followed-up in that direction. The Committee came out with the

following weakness of co-operative credit system like lag in disbursal, low deposits, high over dues etc. The Committee asked for the preferential treatment of small farmers which is to be well appreciated. Multi-agency approach in agricultural credit had been advocated. Out of five major points related to agricultural credit i.e. 1) multi-agency system for dispensing credit; 2) an explicit relationship between credit and inputs use or credit and fixed investment; 3) Security for loan being no longer the sole determinant of credit; 4) credit planning to subserve the major national programs for agriculture growth, backward area development and eradication of poverty; 5) concessional interest rates for agriculture loans, the multi-agency approach has been suggested by Gadgil (1986)

RBI Bulletin (Oct 1969) made an extensive effort to compare the spread of banking with agriculture development for 300 hundred districts in India. It constructed composite index for a) agriculture development; b) spread of banking; c) extent of deposits mobilisation. The districts were ranked accordingly. The study found that there is a considerable gap in banking development among the districts.

However, some independent study had also been undertaken during the same period. It is being found that three industrially advanced states (Maharashtra, West Bengal and Tamil Nadu at the end of 1968) together accounted for 44.4% of the deposits and 62.2% of the credit. There were high credit deposits ratios in those states which showed that the deposits collected from the backward areas and even from two advanced states Punjab and Gujarat are being diverted to the industrially advanced states of Maharashtra, Tamil Nadu, West Bengal and Andhra Pradesh. On the other hand in the sector-wise distribution of credit, the share of industry in bank credit increased from 50.8% in 1961 to 67.5 in 1968 (Pai , 1970). Thus variation in the distribution of credit did not only exist at the regional level but also at the sector level. The share of agricultural credit was too low compared to the other sectors.

In order to minimise regional variations prevailing across the states in credit distribution, the Reports of the Working Group on Rural Banks (1975) came out to set up of RRBs for speedy and less costly financing of small and marginal farmers and the weaker section of the society. The RRBs are basically commercial banks but have some special features, specific area of operation, target group of weaker section, stipulation of interest rate to be charged not above that co-operatives etc are such

feature specific to RRBs. But the recent functioning of the RRBs show that the specific goals for which it was established i.e., for providing cheap agricultural loans and for the development of small scale industries, has not been kept on the back steps and now they are changing their priority towards consumption loans and also providing credit for the purchase of durable goods. These entire specific features bring about an aspect of non-profitability and non-viability into the system of RRBs.

Despite taking many efforts have taken to bring about formal credit into agriculture sector, the non-institutional agencies accounted for an overwhelming proportion of the credit supply in Kerala and the average rate of interest is much higher than the average indicated by the Reserve Bank's All India Debt and Investment Survey. The bulk of the institutional credit is appropriated by a relatively small proportion of households belonging to the upper stratum of families (Kurup, 1976).

Another aspect of examining agricultural credit is that whether it led to the adoption of modern technology. It is very interesting to analyse how the agricultural credit is helpful in adopting the modern technology to enhance the agricultural production. However, it has been found that there is no difference in the adoption of HYV paddy among the borrowers and non-borrowers in Uttar Pradesh. The proportion of the area under HYV paddy was not higher among borrowers than non-borrowers. It is the lack of assured irrigation and small size of farms which emerged important constraint for lifting of production credit made available to the small framers (Subbarao, 1980). The study reviews the viability question of financial institution and opines that existing interest rate is not adequate to cover-up the transaction cost and risk of default of repayment. Besides, loan recovery is deteriorating. The problem of credit widening raised by the study is very important.

There is a need of critical examination of agricultural credit. The exaggeration of official estimates of the share of institutional credit in rural credit is worth to question. With the help of international studies on the issue of agricultural credit, it has been found that the share of non-institutional credit is still higher than the official estimates (Bell, 1990). The policy measures suggested by Bell are quite significant. In fact, the rigidity and complication in getting agricultural loans creates dead weight price of credit institutions for availing credit, thereby, pushing farmers to money lenders. Also the farmers are to be more efficient in agricultural production so that they can attain

surplus income. With greater income they would be able to repay their loans. It is also necessary from the government point of view that the agricultural surplus produce would be sold at the nearest *Mandi* homes, Therefore, the development of agri-markets are also necessary.

It is also said that the tendency of commercial banks locating into particular region has led to the regional variation in the distribution of agricultural credit. Commercial banks preferred to be located in irrigated areas and they avoided area of drought and floods potential (Biswanger, 1993). The inter-state disparity is found to be quite large. In 1977-78 when it was Rs. 343 credit per hectare for Kerala – whereas, it was just Rs. 6 for Assam. The ranking of the states remained the same for institutional credit to agriculture. Other thing is to be noted that credit distribution was directed towards well off states. Strong association of commercial banks credit and co-operative credit was also found. Thus, CBs progressed on the fertile land created by co-operatives (Kahlan and Singh, 1984; Sahu, 1984).

On the other hand, the positive association between the states with larger proportion of institutional credit and higher proportion of loan against immovable property in the years 1961-62 to 1976-77 was also noted. This indicates the preference of institutional credit agencies for immovable property as a security and negligence of the biggest livelihood provider sector in the country. This led to the domination of private agencies including agriculture and professional money lenders in the system and had occupied the agricultural credit market rural areas. Moreover the highly skewed distribution of institutional credit in favour of relative progressive regions and better off section of agriculture population was likely to generate strong backwash effects, thereby, retarding the overall pace of agriculture development (Haque and Verma, 1988). There is a need of more egalitarian credit plan to be made and maintained for rapid and balanced agriculture development of the country.

The variation in the distribution of credit does not exist in case of CBs and RRBs only; there is also existence of large inter-state and intra-state variation in the distribution of institutional credit from the PACS. In agriculturally backward regions, the amount of loan per borrowers given by PACS was lower while it was higher in some of the agriculturally developed region and in regions with strong cooperative movements (Giri and Gupta, 1988). Loans from commercial banks and RRBs to the

some extent helped to balance the regional disparity in the flow of credit arising due to unequal growth of cooperatives movement. It is being suggested that the distribution of loan should be made according to their relative weightage in total borrowing members and on the basis of medium and long term loans covered by the state. Fixing of credit limit at variable proportion among different size groups of farmers will help to eliminate inter-state and inter-farm differences in the distribution of agricultural credit. There should be extension of activities of CBs and RRBs.

There is an increasing concentration of institutional credit to agriculture in a few regions/ states between 1972 and 1985 but there is also a large uneven distribution of credit among the small and large farm holders existed. Small holders rather than large holder should be taken care of in providing agricultural credit extensively and the bank policy makers should be concerned about this class of borrowers because small farmers are already in a vulnerable position. The identification of credit deficit states may serve as a guide for branch expansion policy of commercial banks in future. It is found that the commercial banks worked on the fertile land of co-operatives (Dadibhavi, 1988).

In spite of taking all these efforts, the role of institutional credit could not improved much extent and the majority small farmers-borrowers are still dependent on non-institutional credit such as commission agents, money lenders, traders etc (Parihar and Singh, 1988). Moreover, the medium and large farmers obtained a higher quantum of advances for short and medium term loans as compared to the small of the farmers. The inter-regional disparities of institutional credit to agriculture led to low private capital formation in agriculture (Rath, 1989). As a result public capital formation in agriculture which was on decline could not complement satisfactorily. This led to overall decline of the capital formation in agriculture.

Shashtri, (1991) seeks to examine whether the flow of financial resources has been accompanied with the goal of reducing regional disparities among the districts of Rajasthan. Financial assistance from Rajasthan Industrial Investment Corporation (RICCO) and Rajasthan Financial Corporation (RFC), and per capita credit is almost solely concentrated in developed districts while per capita cooperative credit tended to be quite equally distributed. It is true that co-operatives, compared to other

institutional sources have penetrated to larger extent in rural areas. But they have experienced great loss due to high transaction cost and default rate.

There has been a great degree of variation in the distribution of institutional credit, created by CBs, PACs and LDBs, across the states during the period 1976-77 to 1991-92 (Jamir, 1996). The reason for this variation is mainly due to the better structure and administration of institutions providing credit to the farmers. The state where the total loans were low is mainly due to low absorbing capacity of credit in those agriculturally backward states. Commercial Banks have greatly contributed in reduction of variation in credit distribution. The major share of institutional credit to small and marginal farmers came from PACs even though their share had gone down from 66.02 percent to 52.83 percent during the study period (Jamir, 1996). The performance of CBs and LDBs has also improved in providing credit to small farmers

Inadequacy of credit is another problem faced by Indian agriculture. Credit delivery to the agriculture sector continues to be inadequate. It appears that the banking system is still hesitant on various grounds to provide credit to small and marginal farmers. The situation calls for concerted efforts to augment the flow of credit to agriculture, alongside exploring new innovations in product design and methods of delivery, through better use of technology and related processes. Facilitating credit through processors, input dealers, NGOs, *etc.*, that are vertically integrated with the farmers, including through contract farming, for providing them critical inputs or processing their produce, could increase the credit flow to agriculture significantly (Golait, 2007).

On the other hand, low transaction cost and high recovery rates of new generation lending institution like SHGs makes it necessary for credit cooperatives and commercial banks to study the mechanism of these institution in terms of their pattern of loan recovery and interest rate structure. It is also being found that the natural calamities, inadequate income generation, government policy of lending at subsidised rate of interest and waving of loans on many occasions, high transaction costs, complicated lending and borrowing procedures and provisioning of NPAs are some of the factors which led to inequality in distribution of loans and uneven regional spread of institutional credit (Gulati and Bathla, 2002).

The above finding has also supported that the administrative costs of lending are bound to be high in rural areas (Bhaduri, 2006). The seasonality of agriculture demands that loans should be provided precisely on time. The sparse distribution of population, especially in dry land tribal areas, raises the cost of servicing, as well as monitoring of loans. Moneylenders are able to cut costs partly because they are better informed about their clients. But most importantly since the profitability of lending depends “to a large extent on the vulnerability and weak bargaining position of the borrower, it is likely that the lender would develop a sort of vested interest in the poverty of the borrower, that is in keeping the latter sufficiently poor to be vulnerable” (Bhaduri 2006: 165).

In brief, in order to rejuvenate rural credit delivery system, the twin problems facing the system, viz., high transaction costs and poor repayment performance, need to be tackled with more fiscal jurisprudence reserving exemplary punishment for wilful defaults, especially by large farmers (Shah, 2001). In fact, insofar as the rural credit delivery system is concerned, the focus should be on strategies that are required for tackling issues such as sustainability and viability, operational efficiency, recovery performance, small farmer coverage and balanced sectoral development (Puhazhendhi and Jayaraman, 1999).

There is a need to examine the technical efficiency of the banking system to examine the supply side aspects of farm credit. The technical efficiency of CBs operating in Pakistan by employing Data envelopment analysis (DEA) under variable returns to scale (VRS) after intensive agricultural lending by commercial banks have been estimated. To measure technical efficiency, inputs and outputs of the commercial banks were defined on the basis of intermediation approach. After the estimation of technical efficiency, Tobit model was used to develop its relationship with bank specific variables. The result shows that the assets, ownership characteristic and after merger effects have been significant contributors to the technical efficiency, while agricultural lending has no significant impact over time on the efficiency of commercial banks (Ahmad, and Gill,2007). But the result can be region specific and cannot be true in each region.



Thus, literature has indicated several reasons behind the uneven flow of credit across the states. It is argued that the deposits collected from the backward areas have been diverted to industrial advanced states and the share of industry in bank credit has increased (Pai, 1970). The bulk of institutional credit is appropriated by relatively small proportions of households belonging to the upper stratum of the families (Kurup, 1976). The lack of assured irrigation and small size of farms emerges as important constraint for lifting of the production credit (Subbarao, 1980). Access to formal credit will affectively bind production decision if the imputed value of capital on the farms, in the absence of formal borrowing, exceeding the cost of formal credit. There has been a decline in the quantum of agricultural credit in Bihar accompanied with an increase in input price during the early 1990s (Nasir, 2003). There are positive association between the states with larger proportion of institutional credit and higher proportion of loan against immovable property was noted. This indicates the preference of institutional credit agencies for immovable property as security (Sahu, 1984).

There is no doubt that rural banking in India has made tremendous quantitative progress. But in the reform period, the share of agricultural credit relative to total credit disbursement came down. It is rightly said that “the near total neglect of rural credit by policy-makers during the period 1991-96 is largely attributable to the adverse environment created by the financial sector reforms” [Mujumdar, 1999]. The policy-makers have yet to arrive at a banking structure and its operational system which suit agricultural credit and saving needs and at the same time promote modern agriculture (Shivamaggi, H. B, 2000).

In order to reduce regional inequality in the distribution of agricultural credit, there is a need of an egalitarian approach. James Tobin (1981 Nobel laureate in economics), spoke of “specific egalitarianism”, which he defined as “non-market egalitarian distributions of commodities essential to life and citizenship”. As Tobin said, “In some instances, notably education and medical care, a specific egalitarian distribution today may be essential for improving the distribution of human capital and earning capacity tomorrow” [Tobin 1970: 276-77]. In our view, rural credit fits very precisely into Tobin’s proposal for “limiting the domain of inequality”, for lack of access to rural credit has certainly been one of the factors depressing growth in

agriculture in the 1990s, which is today regarded as the main drag on the Indian economy.

## **2.2: Determinants of Agricultural Credit**

The determinants of agricultural credit can be region-specific and class-specific. The variable related to irrigation may significantly affect agricultural credit in the states which have more irrigation facility. While the technological variables like tractors, pump sets, tub wells, threshers etc may be useful for the large farmers. In the comparative study of Eastern U.P and Western U.P, It has been found that the beta coefficient of per hectare fertilizers use is significant (affect use of agricultural credit) in both regions with the same magnitude (Subbarao, 1980). It is also found that there is an explicit relationship between credit and inputs use or credit and fixed investment (Gadgil, 1986).

Using the techniques of the deflation index, diversification index and infrastructure development index, it is being concluded that the decline in the quantum of agricultural credit accompanied with an increase in input price had made the quantum of agricultural credit inadequate in Bihar, particularly during the early 1990s (that was because of liberalisation). Further it identified three major factors i.e. fertilizer consumption, dairy cooperatives and bank branches that are influencing agricultural credit significantly (Nasir and Singh, 2003). Hence it may be concluded that efforts to improve the adoption of level of modern crop production technology and expansion of the network of rural institution will help in increasing agricultural credit flow in Bihar.

The share of institutional credit in total investment in farms is being affected by fixed cost per hectare, per capita consumption expenditure. Multiple regression analysis has been used to identify the factors affecting institutional credit. (Parihar and Singh, 1988). While on the other hand facilitating credit through processors, input dealers, NGOs, *etc.*, that are vertically integrated with the farmers, including through contract farming, for providing them critical inputs or processing their produce, could increase the credit flow to agriculture significantly (Golait, R, 2007).

Categorising variables into three parts i.e. banking variables, institutional variables and productivity variables, it is being found that consumption of fertilizers, irrigation intensity and cooperative credit per hectare are significantly affecting agricultural credit provided by commercial banks (CBs) (Paul, 1994). Using step-wise multiple regression analysis, it is also found that consumption of fertilizers, no of tractors, no of tube wells and irrigation are significantly affecting institutional credit (Bhalla, 2010). It is also being found that supply of agricultural credit is negatively associated with investment in government securities, credit subsidy and proportion of credit provided by the cooperatives. Credit supply to agriculture is positively associated with the incidence of rural bank branches (Sahu, and Rajsekhar, 2002).

On the other hand the situation is not much different in other country. There are some other factors like farm size of the farmers; previous year's income, enterprises type, household net worth and level of household agricultural commercialisation are significant but negative factors influencing the bank's decision to ration credit in Nigeria. Higher values of these factors decrease the probability that the borrowers will be credit rationed. The number of dependents in the household has a positive significant impact on the probability of being credit constrained by the banks. Hence higher values of this variable increase the likelihood of being credit rationed. (Rahji and Adeoti, 2010). Similarly farm income improvement policy in terms of adequate remunerations for farmers' price support and provision of storage facilities that will help them speculate the market and not sell at low prices at harvest will improve their probability of being non-credit constrained or rationed. There is the need for a clear cut policy on the percentage of total credit to be allocated to food and cash crop sub-sectors.

### **2.3: Relationship between Agricultural Credit and Growth**

An important study reveals that there was a significant relationship between institutional credit and agriculture growth (yield food grains). Using multiple log linear regression the study found that the institutional credit is significantly affecting yield of food grains during the period 1977 to 1992 (Jamir, 1996). It can be said that agricultural credit if combined with agriculture technology will lead to higher

productivity in agriculture. Credit will help in attaining technology like better seeds, fertilizers and irrigation.

To study the inter-district variation in the levels of fertilizer consumption during the two decades period i.e. 1960-61 to 1979-80 in Andhra Pradesh, it has been concluded that the districts with initially low levels of per hectare of consumption of fertilizers experienced significantly high growth rate in fertilizer consumption and districts with high level of consumption of fertilizer experienced relatively low level of growth indicating some decline in per hectare of consumption of fertilizer in the state. Among the various factors considered, availability of credit per hectare and use of tractors per ten thousands hectare are found to be major factors influencing consumption of fertilizers in Andhra Pradesh (Leela and Sharma, 1989). By taking well established relationship that increase in consumption of fertilizer led to increase in food grain production, it is being found that irrigation intensity and short term credit per hectare are the two most important determinants of consumption of fertilizer per hectare. (Saran, and Sethi, 2000).

On the other hand, the composite index of economic development across the states has been prepared. Multiple regression analysis has been used by taking per capita credit, per capita cooperative credit, percentage share of plan expenditure and financial assistance from RICCO and RFC as independent variables. The study found that the bank credit and financial assistance from RICCO and RFC are significantly influencing level of economic development (Shashtri, 1991).

With the passage of time the cropping pattern in India has experienced dramatic change. Farmers have been attracted to grow cash crops due to high value of output. The impact of institutional credit on the agriculture growth through changes in cropping pattern (CP) has been seen in West Bengal at district level analysis. The provision of larger amount of agricultural credit in post-nationalisation period has played a catalytic role in accelerating agriculture growth through changes in cropping pattern towards commercialisation of agriculture (Ray, 2008). In this study, irrigation intensity, consumption of fertilizers per hectare and institutional credit per hectare are the supply side factors influencing change in CP (percentage of area under non-food crops to GCA). On the other hand, the change in CP has been considered as a factors influencing agriculture growth. It is being found that institutional credit per hectare is

significantly affecting cropping pattern while other supply side factors are indirectly affecting to CP through changes in institutional credit.

However, the impact of agro climatic endowments, financial institutions and government infrastructure on agriculture investment and output has also been examined. Expansion of branches of commercial banks accelerated private investment in agriculture like investments in tractors, increased fertilizer demand dairy development and draft animal (Biswanger, 1993). It is also being found that commercial banks preferred to be located in irrigated areas and they avoided area of drought and floods potential. This study has also brought to notice the negative impact of the rate of interest of bank loans on agriculture investment.

In other study, it has been found that finance variables like RBI accommodation to rural sector, institutional credit to rural sectors) and price variable (PCI) are statistically significant and in economic perception also have significant impact on the dynamics of rural sector income (RNY) during 1971-72 - 1999-2000. However, the effect of real variable (yield all crops, production of all crops and area of cultivation all crops) is puzzling. The causal relationship between rural credit and rural income during 1971-72 to 1999-2000 has been cited through partial analysis, which indicates about the evidence towards the supply leading approach to rural finance. However, it is advocated that let the market should be encouraged gradually for proper allocation of the rural finance upon the sound rural production base and contributed by the institutional initiatives (Chakrabarty, 2003).

In order to determine the impact of institutional credit on agricultural production separately for pre and post reform period, another study (Ahmad, and Masood, 2009) has estimated the production function. The author has found that institutional credit for the overall period 1972-2005 has significant impact on aggregate agricultural production in India. Cobb Douglas production function for the pre reform period (1971-91) gives coefficient which has significant impact on agricultural production. But the model estimated for the post reform period shows that institutional credit does not affect agricultural production. Study concludes that during post reform period the sectoral share of agricultural sector declined and also the growth rate of agricultural credit deteriorated. During post reform period institutional credit is not a significant determinant of agricultural production in India. The study examines the effect of

credit and other variables on the agriculture production over the period but it does not cover regional aspect of credit distribution. A study on the same lines for Nepal shows that despite of strong correlation between institutional credit and real GDP of the agriculture sectors in a given period of time, it is being proved that institutional credit has been only a mild cause of agriculture sector growth in Nepal (Shreshta, 1992).

Another important article that examines the possible relationship uses panel data on rural poverty and the spread of bank branches to argue that increase in access to credit has helped reduce rural poverty. It has been found that opening of bank branches makes formal credit accessible and in the long run seems to have a positive impact on poverty (Burgess and Pandey 2003). To illustrate their argument, the authors contrast the poverty rates with the period of pre- and post-liberalisation (when the condition to open more branches in unbanked areas was dispensed with). While establishing their argument they also cite others (Eastwood and Kohli 1999) who argue that the expansion of branches actually enhanced the lending to the rural small-scale sector where the growth was faster. Thus, it is possible to take these independent conclusions together to indicate that possibly, the positive impact on poverty might have come from the non-farm sector (Sriram, 2007). So, the thrust of Burgess and Pandey is that in order to address poverty it is necessary to have formal banking outlets. However, the impact on poverty seems to come from non-primary sectors like enterprise and the resultant wage employment that these enterprises generate.

Another important study that examine the overall growth of agriculture and the role of credit (Mohan 2006) has shown that, despite going down the overall supply of credit to agriculture as a percentage of total disbursement of credit, the share of formal credit as a part of agriculture GDP is growing. The basic thrust of the article ( Sriram ,2007) comes up with the following conclusion (i) it is extremely difficult to establish the causality of credit-agricultural productivity; there are too many intervening variables; (ii) our policy for rural credit has largely run on uni-focus on agriculture and small supply induced non-farm credit; (iii) the demand side indicates a diverse market; (iv) rural people understand the tradeoffs between access to financial services and the costs (in terms of access). and (v) it is best to have policy interventions in the areas of target setting and branch licensing, while leaving the specifics of individual

transactions including write offs and settlements to the commercial acumen of the field functionaries of the institutions.

Thus, the foregoing review brings about number of important dimensions of agricultural credit. The dependency of agriculture on credit increased due to rapid expansion of credit institutions. The overall thrust of the current policy regime assumes that credit is a critical input that affects agricultural/rural productivity and is important enough to establish causality with productivity. The thrust of doubling agricultural credit in three years through the banking channel, the revival of co-operative credit structure through the package recommended by the Vaidyanathan committee and the policy response to farmer suicides, including the Vidarbha package, are excessively skewed towards intervention in the agricultural operations through intervention in credit (Sriram, 2007). The literature also brings forth some researchable issues as follows:

#### **2.4: Some Research Issues**

- Growing disparities among farmers as per land size of their holding because of the biased approach of the banks
- Inequality in the distribution of credit among various regions and classes of people.
- Rising NPAs, low financial margins and high cost of rural lending compel the banks to close on viable rural branches.
- Untimely delivery of credit and cumbersome procedures and formalities to transact credit.
- High transaction cost creates constraint in the flow of long term credit.
- The bulk of institutional credit is appropriated by relatively small proportions of households belonging to the upper stratum of the families
- The rural demands are not being supplied by banks. The non-institutional sources are still having significant share in the rural credit.

- Due to poor recovery of the rural financial institution (especially cooperatives), the default rates in rural areas are very high. Only 12% of rural credit requirement are fulfilled out of which 80% goes to the large farmers.



## **Chapter: 3**

### **Inter-State and Inter-Regional Analysis of Institutional and Non-Institutional Sources of Credit to Agricultural Sector**

#### **3.1: Introduction:**

One of the key factors for the progress of any economic sector is the availability of adequate credit. In the case of agriculture, it is not only the availability of credit but access to adequate credit from institutional sources that matters the most. Since majority of the farmers who are involved in agriculture belong to small and marginal farmers' categories. The growth of this sector has to be accompanied by good credit facility both in quantity and servicing this credit (cost of credit) as well. As it is known that credit is an important input and it acts as a catalytic agent for accelerating the growth of rural sector, it has to be supported by other inputs such as technology, seeds, fertilizers, pesticides, irrigation facility, extensive support and motivation from the government agencies.

As analysed in chapter 1, credit institutions have undergone qualitative and quantitative changes since the nationalization of banks took place during the 60s and 70s. It was expected that the role of institutional credit will improve the situation of the farmers. Despite large finance flooded in rural credit market, the situation of farmers has not improved much. However, it is often said that the benefits of institutional credit facilities have been greatly shared by upper-strata of the society. It has happened mainly due to the emergence of new type of money lenders such as MFIs and traders and also due to the high transaction cost of institutional credit.

The specific objectives of this chapter are to (a) study the relative role of institutional and non-institutional sources of credit in major states, b) examine the extent of regional variations and growth in farm credit by commercial banks (CBs), regional rural banks (RRBs) and cooperatives from 1981 to 2008. The chapter is divided into two sections dealing with the first and second objectives.

### 3.2: Role of Institutional and Non-institutional Sources of Credit

In order to examine the relative role of institutional and non-institutional sources of credit, the NSSO report of farmer's indebtedness has been taken into consideration for the year 1981, 1991 and 2002. It is borne out from the Table 3.1 that there was a remarkable increase in the percentage share of institutional credit to total rural credit in the decades of 70s in all the regions, except Assam where it witnessed marginal decline. In the next decades, Assam had shown increase from 30.6 percent to 66 percent share of institutional credit. But in the reforms period its share declined around 37 percent. Considering the country as a whole, institutional sources accounted for about 61 percent of the total loans outstanding in 1981 which increased to 66 percent in 1991 and further marginally declines to 57.7 percent. While the share of non-institutional credit increased to 42.4 percent in 2002 from 34 percent in 1991. The NSSO survey reveals that the share of institutional credit agencies in the outstanding amount of cash dues of the rural households declined by about 7 percentage points between 1991 and 2002.

| State                 | Institutional |             |             | Non-Institutional |             |             |
|-----------------------|---------------|-------------|-------------|-------------------|-------------|-------------|
|                       | 1981          | 1991        | 2002        | 1981              | 1991        | 2002        |
| Haryana               | 75.8          | 73          | 67.6        | 24.2              | 27          | 32.5        |
| HP                    | 74.5          | 62          | 65.3        | 25.5              | 38          | 34.7        |
| J&K                   | 43.5          | 76          | 67.6        | 56.5              | 24          | 32.3        |
| Punjab                | 74.2          | 79          | 47.9        | 25.8              | 21          | 52.1        |
| UP                    | 55.1          | 69          | 60.3        | 44.9              | 31          | 39.7        |
| <b>NW Region</b>      | <b>64.6</b>   | <b>71.8</b> | <b>61.7</b> | <b>35.4</b>       | <b>28.2</b> | <b>38.3</b> |
| Assam                 | 30.6          | 66          | 37.5        | 69.4              | 34          | 62.6        |
| Bihar                 | 47.2          | 73          | 41.7        | 52.8              | 27          | 58.5        |
| Orissa                | 81            | 80          | 74.8        | 19                | 20          | 25.1        |
| WB                    | 65.5          | 82          | 58          | 34.5              | 18          | 42.1        |
| <b>East Region</b>    | <b>56.1</b>   | <b>75.3</b> | <b>53</b>   | <b>43.9</b>       | <b>24.8</b> | <b>47.1</b> |
| Gujarat               | 70            | 75          | 69.5        | 30                | 25          | 30.5        |
| MP                    | 66.3          | 73          | 56.9        | 33.7              | 27          | 43          |
| Maharashtra           | 86.4          | 82          | 83.8        | 13.6              | 18          | 16.2        |
| Rajasthan             | 40.9          | 40          | 34.2        | 59.1              | 60          | 65.8        |
| <b>Central Region</b> | <b>65.9</b>   | <b>67.5</b> | <b>61.1</b> | <b>34.1</b>       | <b>32.5</b> | <b>38.9</b> |
| AP                    | 40.9          | 34          | 31.4        | 59.1              | 66          | 68.6        |
| Karnataka             | 78.2          | 78          | 68.9        | 21.8              | 22          | 31.2        |
| Kerala                | 78.6          | 92          | 82.3        | 21.4              | 8           | 17.6        |
| Tamil Nadu            | 44.3          | 58          | 53.4        | 55.7              | 42          | 46.5        |
| <b>South Region</b>   | <b>60.5</b>   | <b>65.5</b> | <b>59</b>   | <b>39.5</b>       | <b>34.5</b> | <b>41</b>   |
| <b>ALL INDIA</b>      | <b>61.2</b>   | <b>66</b>   | <b>57.7</b> | <b>38.8</b>       | <b>34</b>   | <b>42.4</b> |

Source: All India Debt and Investment Survey, NSSO 37<sup>th</sup>, 48<sup>th</sup> and 59<sup>th</sup> Round.

It is worrying to note that in many states including Andhra Pradesh, Karnataka, Maharashtra, Rajasthan, Haryana and Himachal Pradesh, the farmers continue to borrow largely from non-institutional sources. From 1981 to 1991 Himachal Pradesh witnessed more than 10 percent decline its share of credit from institutional sources. While in other six states the share declined marginally in the same period. Considering only those states which registered increase in the share of institutional credit (or decrease in the share of non-institutional credit) it is obvious that most of the states have shown vast increase. In the decade of pre-reform the share of institutional credit increased from 30.6 percent in 1981 to 66 percent in 1991 in Assam followed by 43.5 percent to 76 percent in Jammu & Kashmir, 55.1 percent to 69 percent in Uttar Pradesh, 47.2 to 73 percent in Bihar and 65.5 to 82 percent in West Bengal.

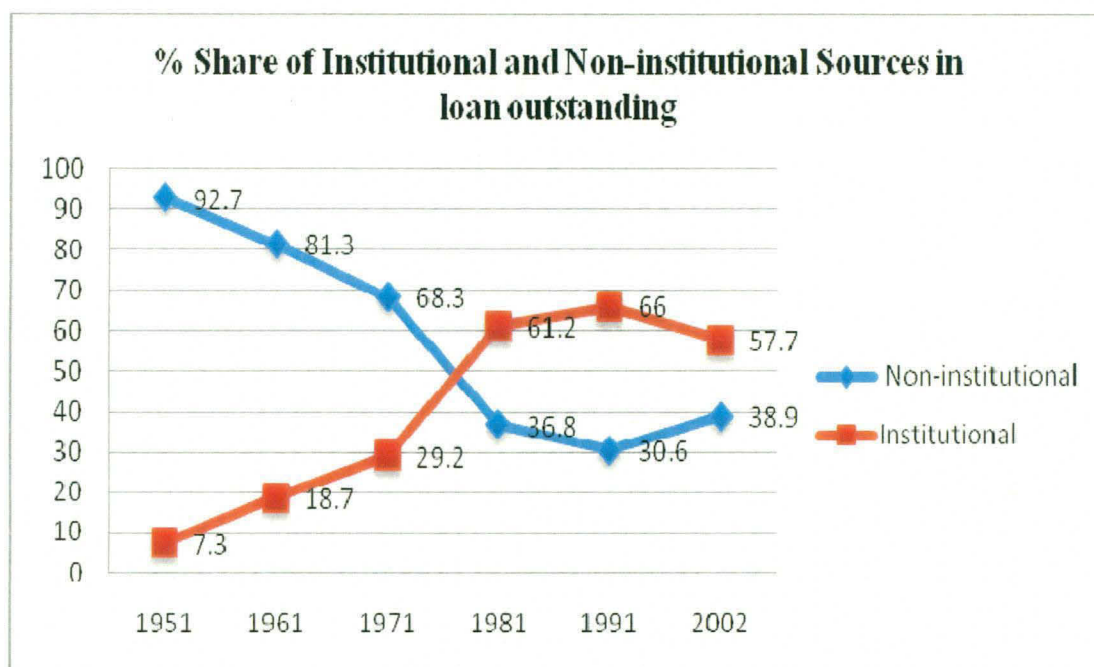
From 1991 to 2002 the share of institutional credit (or the share of non-institutional) has not only declined (or increased) at the All India but also at the regional level. It declined in all states, except Assam where it increased marginally from 62 percent to 65.3 percent. At the regional level, including national average the share in 2002 came down to less than its share in 1981. At the regional level the share of institutional credit in total rural credit increased significantly in Eastern Region (56.1 percent to 75.3 percent) followed by other regions..Thus the rapid expansion of banking facilities in rural areas through nationalization of banks could not be sustained at the state level in the decade of 80s and 90s. In the period of liberalization, the dependency of the rural households on the non-institutional sources of credit increased in all the states, except Himachal Pradesh where it witnessed a marginal decline.

However, if we see temporal variation in Table 3.2, the survey revealed that the share of institutional credit agencies in the outstanding loans of the rural households declined by about 7 percentage points between 1991 and 2002 and it was 57.7 per cent in 2002. This is in sharp contrast to earlier periods wherein there were gradual increases in each decade. The share of borrowing of cultivators' household from institutional sources increased from 7.3 percent in 1951 to 66.1 percent in 1991. Though the pace of increase decelerated, still there was a 3 percentage point increase to 64 percent in 1991. Between 1991 and 2002, borrowing of rural households increased sharply, especially from non-institutional sources.

| <b>Credit Agency</b>                         | <b>1951</b> | <b>1961</b> | <b>1971</b> | <b>1981</b> | <b>1991</b> | <b>2002</b> |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Cooperatives and CBs                         | 5.7         | 10.3        | 24.4        | 58.6        | 58.8        | 55.2        |
| Govt and Other formal Sources                | 3.1         | 5.5         | 7.3         | 4.6         | 7.5         | 2.5         |
| <b>All Institutional agencies</b>            | <b>8.8</b>  | <b>15.8</b> | <b>31.7</b> | <b>63.2</b> | <b>66.3</b> | <b>57.7</b> |
| Professional and agriculturist Money lenders | 68.6        | 62          | 36.1        | 16.1        | 17.5        | 25.7        |
| Traders                                      |             | 7.2         | 8.4         | 3.1         | 2.2         | 5.2         |
| Landlords                                    |             | 7.6         | 8.6         | 4           | 4           | NA          |
| Relatives and Friends                        | 14.4        | 6.4         | 13.1        | 11.2        | 4.6         | 8.5         |
| Other Sources                                | 8.2         | 0.8         | 2.1         | 2.4         | 2.3         | 3           |
| <b>All Non-institutional agencies</b>        | <b>91.2</b> | <b>84</b>   | <b>68.3</b> | <b>36.8</b> | <b>30.6</b> | <b>42.4</b> |
| Total  | 100         | 100         | 100         | 100         | 100         | 100         |

Source: Source: All India Debt and Investment Survey, NSSO.

**Figure: 3.1:**



Source: ibid

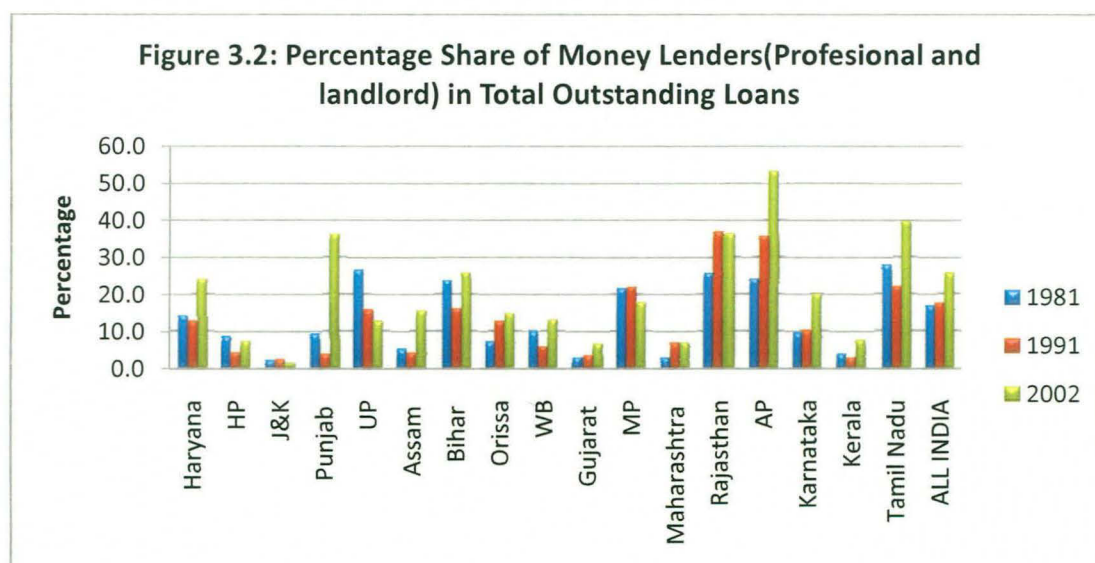
If we see the source-wise trend of loans outstanding, it is obvious that the professional and agricultural money lender with 68.6 percent of the total loans outstanding was the major contributor in 1951. It has been followed by the relatives and friends (14.4 percent), cooperatives and commercial banks (5.7 percent) and government and other formal sources (3.1 percent). The share of money lenders with continuous decline in the first three decade reached 16.1 percent in 1981. In latter period it increased to 17.5 percent in 1991 and 25.7 percent in 2002. On the other hand the share of cooperatives

and banks had shown an increasing trend up from the beginning of reform period (from 5.7 percent in 1951 to 58.8 percent in 1991). Unlike the money lender, the share of the former declines marginally (55.2 percent). Thus the importance of non-institutional sources of loans increased in the reform period. “The increase in household indebtedness was largely on account of consumption and similar other expenditure. It is, therefore, possible that the increase in indebtedness of cultivator household to non-institutional sources was also partly on account of consumption expenditure, which could not easily be financed from the institutional sources. (Report on Currency and Finance, 2006-08)

It is well known that the early 1990s was a period of sharp fall in the growth of agricultural credit flow in India. Numerous studies and reports have argued that one of the major factors associated with the agrarian distress in the late 1990s and 2000s was an increase in the rural indebtedness, especially to money lenders. But the reason behind the increase in the share of non-institutional sources of outstanding was the financial sector reforms after 1991 which had systematically undermined the institutional credit arrangements for agriculture. It is argued that the negative policy on credit for agriculture and other priority sectors, which has been prevalent since the beginning of the post-reform era, has manifested itself in three broad areas: the debilitation of the institutional architecture for rural credit, disincentivisation of credit flow to agriculture through the mechanical application of Basel norms and the squeeze on resources available for agricultural credit operations (Satish, 2007). The effects of these policies have been shown by the NSSO survey. The reversal of agricultural credit flow had taken place in the 2000s. As in the early 2000s the growth of credit to agriculture began to pick up. Commercial banks and Regional Rural banks have played an important role in the revival of agricultural credit.

There is a need to examine source-wise trend of loan outstanding by non-institutional agencies across the states. In Table 3.1 (see in Appendix) the share of major non-institutional sources in total outstanding loans outstanding has been shown. The National Sample Survey (37<sup>th</sup>, 48<sup>th</sup> and 59<sup>th</sup>) shows that the share of money lenders increased to 17.6 percent in 1991 from 16.8 in 1981 and jumped to 25.7 percent in 2002. It is already explained that the total outstanding loans from non-institutional sources of credit played a very important role in the reform period due to low expansion of

formal banking system. First of all take the case of money lenders (both professional and agriculturist money lenders) who are major contributors from the side of non-institutional sources of credit. It is borne out from the Table 3.1 (in Appendix) that the money lenders contributed significantly in 1981 (greater than the national average percentage share of 16.8 percent) to the total supply of rural credit in many states including Tamil Nadu( 28 percent), Uttar Pradesh(26.5), Rajasthan(25.9 percent), Andhra Pradesh( 24.2 percent), Bihar( 23.9 percent) and Madhya Pradesh( 21.6 percent). Despite decline in most of the states, the share of money lenders between 1981 and 1991 increased marginally from 16.8 percent to 17.6 at the national average. There are only seven states out of 17 states like Orissa, Gujarat, MP, Jammu and Kashmir, Maharashtra, Rajasthan, Andhra Pradesh and Karnataka where the share of money lenders increased in the pre-reform decade.

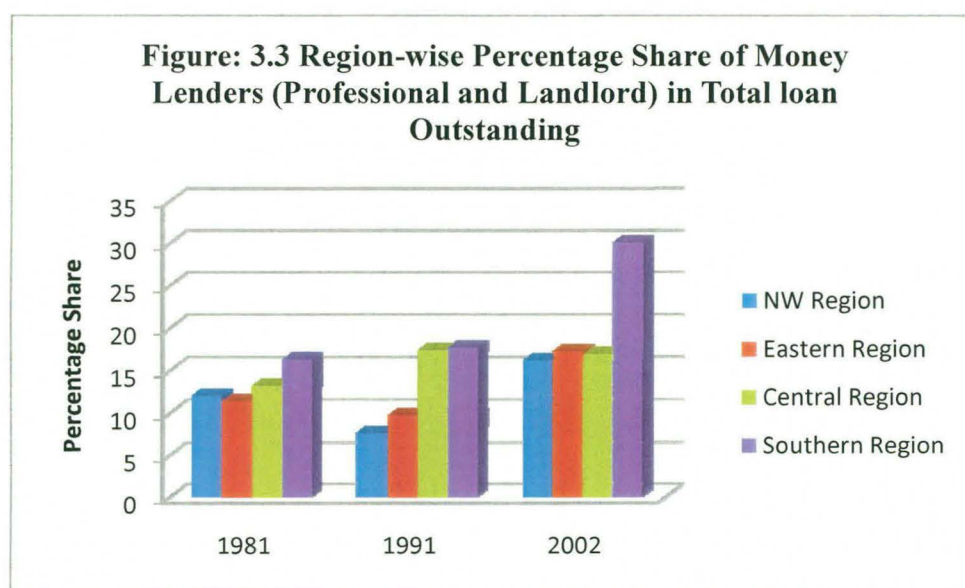


Source: Table 3.2 Appendix

The NSSO Survey (Appendix Table 3.1) further reveals that the share of money lenders significantly increased in 2002 (greater than the national average percentage share of 25.7). The states like Andhra Pradesh (53.4), Tamil Nadu (39.7), Rajasthan (36.5), Punjab (36.3), Haryana (24.1) and Bihar (25.9) were above the national average. In the state of U.P. and M.P. which were showing the share of money lenders above the national average in 1981 went out of this category in 2002. Punjab was the new state which came into this category in 2002. In the period 1991 to 2002 the share of money lenders increased in all states exception being Jammu and Kashmir and Uttar Pradesh (UP) where it declined from 2.2 to 1.1 percent and 15.7 to 12.5 percent,



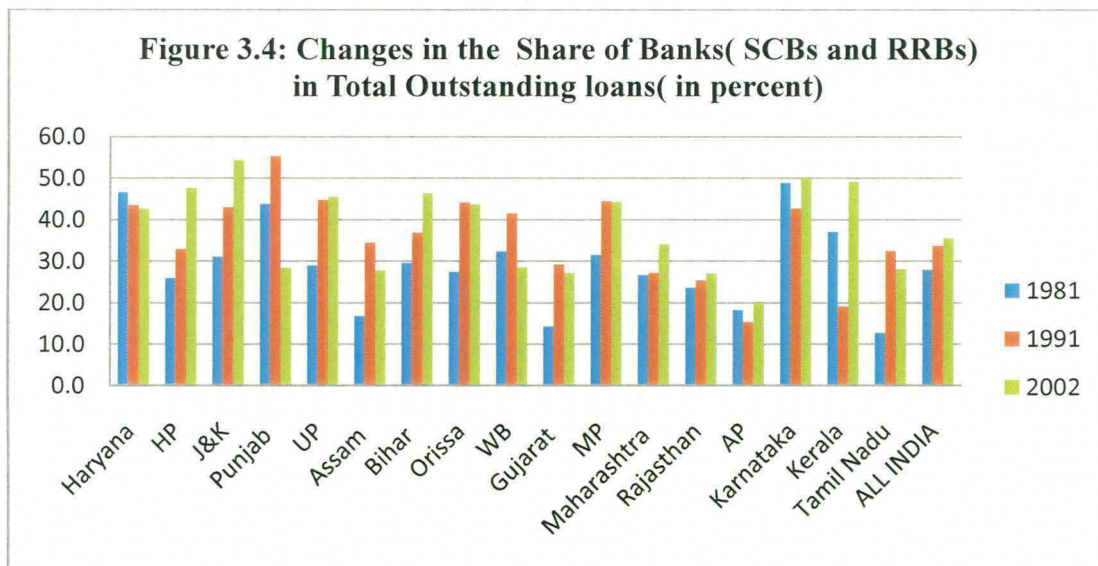
respectively. But in Jammu and Kashmir informal lenders developed in the form of traders whose share increased from 2.2 percent in 1991 to 15.2 percent in 2002. Uttar Pradesh is the only state where the share of money lenders declined from 1981 onwards. The states which had shown low share of money lenders in the reform period have been financed by the other non-institutional sources like the traders and, relatives and friends. Even if we see at the regional level the trend is not much enthusiastic. It is shown in figure 2 that the share of money lenders between 1991 and 2002 increased from 17.7 to 30.1 percent in Southern region followed by North West region where it increased to 16.2 from 7.6 percent in the same period. In the Eastern region it increased to 16.2 from 7.6 percent in the same period. In the Eastern region it increased from 9.7 to 17.3 percent, exception being Central region where it declined marginally in the same period. The figure shows that the share of money lenders continuously increased in all region exception being Central Region where it marginally declined in the reform period.



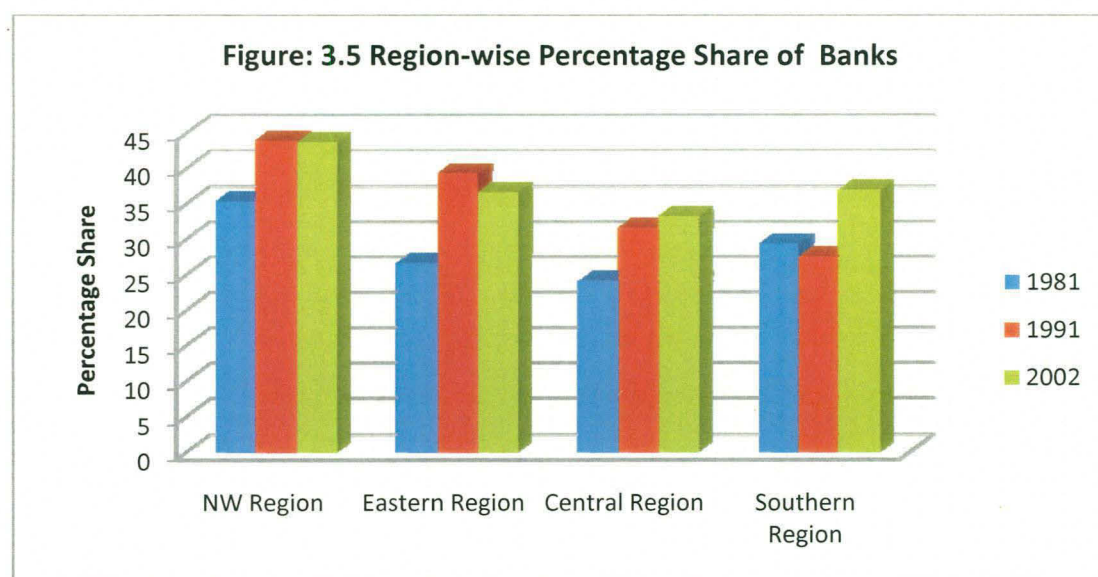
Source: Appendix Table 3.1

In the case of institutional sources of loans supplied by the banks and cooperatives, one may find that two are main drivers in institutional sources of loans. Before going into other details, there is need to analyse changes in the share of these two institutions separately. In figure 3.4 the percentage share of the banks in total outstanding has been shown for the year 1981(NSSO 37<sup>th</sup> Round), 1991(48<sup>th</sup> Round) and 2002(59<sup>th</sup> Round). At all India level the share of the banks which was increased about 6 percent (from 28 percent in 1981 to 33.7 percent in 1991) in the pre-reform period reached 35.6 percent in 2002. Despite increase in the national average in both

periods, the share of the banks at the state level is showing uneven results. There were only six states viz, Himachal Pradesh, Jammu and Kashmir, U.P, Bihar, Maharashtra and Rajasthan where of the share the banks increased over the period. Whereas in rest of states, except Haryana where it declined continuously, had shown mixed results in the given period. Between the year 1981 and 1991, there were four states i.e. Rajasthan and three from Southern region (Andhra Pradesh, Karnataka and Kerala) where the share of the banks came down.



Source: Appendix 3.2

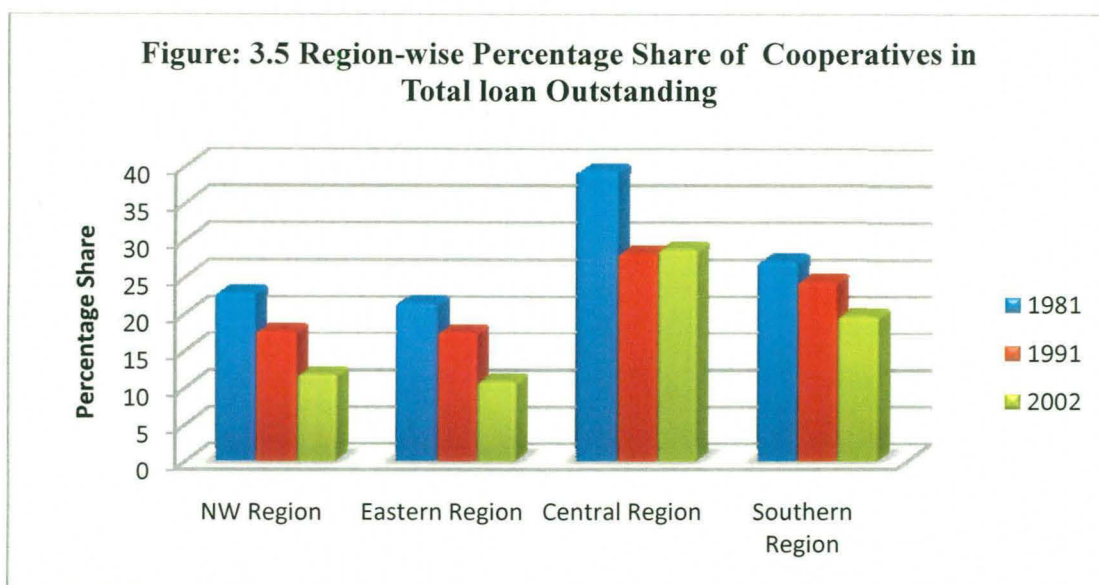


Source: Appendix 3.2



The result in case of cooperatives revealed that it had contributed more than 40 percent of total rural borrowing in four states like Himachal Pradesh (41.7 percent), 46.7 percent, Gujarat (53.8 percent) and Maharashtra (54.8 percent) in the year 1981. At the national level the share of cooperatives came down from 28.7 percent in 1981 to 21.6 percent in 1991 and 19.6 percent in 2002. Because of large expansion of scheduled commercial banks (SCBs) in 1980s, ten states out of 17 had registered decline in its share of the borrowing from cooperatives. While in the reform period, the decline came in 13 states due to lack of focus on agriculture.

However, at the regional level, the results are not much different. The share of cooperatives in North-West region which includes Haryana, Punjab, Himachal Pradesh, Jammu and Kashmir, and U.P was the highest in comparison to all other regions over the period. The Southern region (Kerala, Karnataka, Andhra Pradesh and Tamil Nadu) in which the share of the banks was around 28 percent in the year 1981 and 1991 reached 36.8 percent in 2002.



Source: Table 3.2 Appendix

| Regions       | Banks (CBs & RRBs) |      |      | Cooperatives |      |      |
|---------------|--------------------|------|------|--------------|------|------|
|               | 1981               | 1991 | 2002 | 1981         | 1991 | 2002 |
| North Western | 35.3               | 43.9 | 43.7 | 22.8         | 17.6 | 11.8 |
| Eastern       | 26.6               | 39.3 | 36.6 | 21.5         | 17.5 | 10.9 |
| Central       | 24.0               | 31.6 | 33.2 | 39.4         | 28.2 | 28.7 |
| Southern      | 29.3               | 27.4 | 36.8 | 27.1         | 24.4 | 19.7 |

Source: Appendix 3.2

It may be seen from Table 3.3 that bank credit accounted for the highest percentage share (about 35.6 percent) in the total supply of loans outstanding in rural India, followed by money lenders (25.7 percent), cooperatives (19.6 percent), other sources including relatives and friends (11.5 percent), traders (5.2%) and government (2.5 percent). In the states of Assam, Bihar, Jammu & Kashmir, Rajasthan and Uttar Pradesh, however, the percentage share of co-operatives were found to be comparatively very low, i.e., less than 10 percent of total credit. The banks including the RRBs, SCBs and CBs were found to be major suppliers of the rural credit in Haryana (42.6%), Himachal Pradesh (47.6%), Jammu & Kashmir (54.3), Kerala (49.1%), Orissa (43.7), and Uttar Pradesh (51.2%).

Table 3.4 further reveals that the money lenders, the second largest suppliers, contributed significantly (greater than the national average percentage share of 25.7) to the total supply of the credit in many regions including Andhra Pradesh (53.4%), Bihar (32.8%), Punjab (36.3%), Rajasthan (36.5%), Tamil Nadu (39.7%) which indicate how the relatively better-off farmers in these regions tended to invest their surplus resources in the usurious money lending rather than in modern technical inputs. Similarly, the traders contributed significant amount in the State of Jammu & Kashmir, Rajasthan and West Bengal where it is more than 10% of the total supply of the credit.

As already explained that an increase in indebtedness of rural households household to non-institutional sources was also partly on account of consumption expenditure, which could not easily be financed from the institutional sources. On the other hand negative policy regarding the agriculture also forced to the cultivators towards non-institutional sources. It is also promoted by some other factors. It is obvious that percentage share of total credit of scheduled commercial banks for priority sectors went up from 14 per cent in 1969 to around 40 per cent by the end of the 1980s. Whereas the share of agriculture in priority sector lending had reached 19 per cent by 1985. It remained around that figure until 1990 [Chavan 2005:118]. On the other hand, the share of agriculture in total bank credit has fallen from 19 per cent in 1990 to under 11 per cent in March 2005 (Shah, Rao and Shankar: 1357). While the priority sector lending remained as high as 37 per cent even in 2005, it must be noted that the reform period led to a widening of the definition of the priority sector in

several ways that dilute the focus on agriculture and the weaker sections [Chandrasekhar and Ray 2005: 20-24].

### **3.3: Regional Variations and Growth in Agricultural Credit (1981 to 2008): Commercial Banks, Regional Rural Banks and Cooperatives**

In this section, the regional distribution of agricultural credit supplied by the Commercial Banks (CBs), Regional Rural Banks (RRBs) and Cooperatives has been taken into consideration. Despite the fact that agricultural finance from the institutional sources has grown considerably, many studies Kurup(1976), Gadgil, (1986), Bell, (1990), Giri and Gupta,(1988), Dadibhavi (1988), Parihar and Singh (1988), Shashtri,(1991), Jamir,(1996), Puhazhendhi and Jayaraman (1999) pointed out that inter-regional and inter-class disparities in the distribution of agricultural credit have increased.

Commercial Banks (CBs) and cooperatives are the two major institutional credit disbursing agencies operating in rural areas. Given their limited geographical spread in the rural areas a rather low share of institutional credit in the total credit supplied and the conscious policy of opening new branches in the unbanked areas, there appears to be a considerable scope for both these agencies to expand without having to compete in a significant fashion. There are two ways by which inequality in the distribution of agricultural credit can be measured- one, by assessing the percentage share of agricultural credit going to different states; two, by measuring the dispersion in the credit per hectare across the states.

Percentage share of agriculture going into various states reveal a high level of unevenness when we compare it with net sown area (NSA) of the states. For example six states viz Haryana, Punjab that are more prosperous and four southern states Andhra Pradesh, Karnataka, Kerala and Tamil Nadu which are historically well banked states and six other states viz four Eastern states (including Assam, Bihar, Orissa, West Bengal), MP and Rajasthan which are relatively less developed and less banked. The former six states which possess about 25 percent of the NSA received 54.24 percent of agricultural credit from SCBs (including RRBs) and Cooperatives in 1981, 51.27 percent in 1991, 54.9 percent in 2001 and 50.47 percent in 2008. While the latter six, accounting for about 40 percent of NSA could avail about 20.51 percent,

21.19 percent, 18.08 percent, 20.62 percent of total agricultural credit in the corresponding years (Table 3.4). In spite of the revival of agricultural credit, the unevenness in terms of percentage still prevailed across the states.

| <b>Table: 3.4: Percentage Share of Major States in Absolute Outstanding Loans and Net Sown Area</b> |   |              |              |              |  |              |              |              |
|---|---|--------------|--------------|--------------|--|--------------|--------------|--------------|
| <b>State</b>  | <b>Share in Outstanding Loans at 1999-2000 prices</b> |              |              |              | <b>Percentage share of Net Sown Area</b> |              |              |              |
|   | <b>1981</b>   | <b>1991</b>  | <b>2001</b>  | <b>2008</b>  | <b>1981</b>                              | <b>1991</b>  | <b>2001</b>  | <b>2008</b>  |
| Haryana   | 5.23  | 4.39         | 5.29         | 4.96         | 2.57                                     | 2.51         | 2.5          | 2.55         |
| HP  | 0.56  | 0.52         | 0.47         | 0.57         | 0.41                                     | 0.41         | 0.39         | 0.39         |
| J&K   | 0.43  | 0.17         | 0.2          | 0.47         | 0.51                                     | 0.51         | 0.53         | 0.52         |
| Punjab  | 8.67  | 7.6          | 7.17         | 5.96         | 2.99                                     | 2.97         | 3.02         | 2.97         |
| UP  | 13.06   | 8.43         | 9.25         | 9.87         | 12.28                                    | 12.16        | 12.48        | 12.2         |
| <b>NW Region</b>  | <b>27.95</b>  | <b>21.11</b> | <b>22.38</b> | <b>21.84</b> | <b>18.75</b>                             | <b>18.56</b> | <b>18.93</b> | <b>18.63</b> |
| Assam   | 0.31  | 0.71         | 0.47         | 0.51         | 1.89                                     | 1.9          | 1.94         | 1.95         |
| Bihar   | 3.49  | 4.12         | 1.99         | 2.66         | 5.93                                     | 5.41         | 5.27         | 5.11         |
| Orissa  | 3.31  | 2.19         | 2.63         | 2.96         | 4.37                                     | 4.43         | 4.13         | 3.99         |
| WB  | 4.33  | 3.14         | 4.04         | 3.84         | 3.97                                     | 3.75         | 3.84         | 3.76         |
| <b>East Region</b>  | <b>11.43</b>  | <b>10.15</b> | <b>9.13</b>  | <b>9.97</b>  | <b>16.16</b>                             | <b>15.5</b>  | <b>15.18</b> | <b>14.82</b> |
| Gujarat   | 8.65  | 6.76         | 6.27         | 5.49         | 6.83                                     | 6.53         | 6.69         | 6.92         |
| MP  | 6.94  | 7.81         | 6.98         | 6.47         | 13.33                                    | 13.75        | 10.39        | 13.78        |
| Maharashtra   | 13.27   | 12.85        | 11.63        | 11.73        | 13.05                                    | 12.61        | 12.5         | 12.4         |
| Rajasthan   | 5.34  | 3.53         | 4.53         | 4.94         | 10.88                                    | 11.51        | 11.24        | 12.14        |
| <b>Central Region</b>   | <b>34.2</b>   | <b>30.94</b> | <b>29.41</b> | <b>28.65</b> | <b>44.09</b>                             | <b>44.4</b>  | <b>40.83</b> | <b>45.24</b> |
| AP  | 13.07   | 11.2         | 11.53        | 11.75        | 7.66                                     | 7.75         | 7.88         | 7.64         |
| Karnataka   | 8.6   | 7.94         | 8.76         | 7.74         | 7.06                                     | 7.3          | 7.38         | 7.4          |
| Kerala  | 7.47  | 8.12         | 8.52         | 13.4         | 1.55                                     | 1.58         | 1.56         | 1.48         |
| Tamil Nadu  | 11.21   | 12.03        | 13.22        | 6.65         | 3.82                                     | 3.92         | 3.76         | 3.59         |
| <b>Southern Region</b>  | <b>40.34</b>  | <b>39.28</b> | <b>42.03</b> | <b>39.55</b> | <b>20.09</b>                             | <b>20.55</b> | <b>20.58</b> | <b>20.11</b> |
| Total 17  | 86.49   | 98.57        | 87.59        | 96.41        | 99.09                                    | 99.01        | 95.51        | 98.8         |
| Others  | 13.45   | 1.34         | 12.41        | 3.59         | 0.91                                     | 0.99         | 4.49         | 1.2          |
| All India   | 100   | 100          | 100          | 100          | 100                                      | 100          | 100          | 100          |

Source: Statistical Statement Related to Banks and Basic Statistical Returns (BSR), RBI.

: Agriculture Statistics at a Glance, Various Issues, Ministry of Agriculture.

If we make comparison on the basis of region (given in Table 3.4) the unevenness in the distribution of agricultural credit will be clearer. The southern region wherein the share of NSA is more than 20 percent over the period entertained with 40.34 percent of total agricultural credit in the 1981, 39.28 percent in 1991, 42.03 percent in 2001 and 39.55 percent in 2006-08. On the other hand, the Eastern region (Assam, Bihar, Orissa and West Bengal) in which the share of NSA is around 16 percent received about 11.43 percent of the total credit in 1981, 10.15 percent in 1991, 9.13 percent in 2001 and 9.97 percent in the corresponding years. North Western region is the only

region where the percentage share of NSA is more or less equal with percentage share of agricultural credit.

### **3.3.1: Agricultural Credit Per Hectare of NSA (Intensity of Credit): Commercial Banks**

Comparison of the states on the ground of agricultural credit in absolute terms may not be fully justifiable because agricultural activities and thereby credit requirement may vary from state to state. A comparison is possible if and only if we can normalize the agricultural credit. There is a need of optimum norms of production efficiency to define credit requirement in agriculture. There are two methods, first, we can relate credit requirement with man power employed in agriculture or the area of land actually cultivated. Unlike industry the problem of disguised unemployment exist in agricultural sectors. The reliability of data on “man power employed” will be questioned. The latter method, therefore, will be more suitable and reliable because of readily available data. Therefore a standardise unit, taken here for comparison is the agricultural credit per hectare of NSA as the measure of agricultural activities in a region.

In this study on institutional credit to agriculture, mainly Commercial Banks (CBs), Regional Rural Banks (RRBs) and Co-operative banks, has been taken. For the co-operatives, the Primary Agricultural credit Societies (PACS) has been cached-up. The PACs gives loans of short term and medium term only. Table 3.5 shows the outstanding of CBs to agriculture at the all India level. The growth rate has been calculated by regression analysis.

Thanks to the revival of agricultural credit by the institutional sources, agricultural credit per hectare of NSA has grown considerably in the recent years. During the study period which is from 1981 to 2008, it is observed that the total amount of loan outstanding in terms of Rupees per hectare of NSA, at all India level in 1981 was just Rs 1239 per hectare reached to Rs 2388 per hectare up to the beginning of reform period 1991, Rs 2779 per hectare in 2001 and Rs 11037 in the year 2006-08. The decadal growth rate has been worked for the pre and post reform period. At all India level, the credit per hectare of CBs grew at the annual compound growth rate of 9.2 percent in the pre reform period (1981-1990), 1.43 percent in the first decade of

reform period (1991-2000) and 23.07 percent in the period 2001-2008. While the growth rate for the whole study period (1981-2008) was 5.91 percent.

| State                  | Outstanding Loan of CBs in Rs per hectare |               |               |              | Decadal Growth Rate |             |              |             |
|------------------------|---|---------------|---------------|--------------|---------------------|-------------|--------------|-------------|
|                        | 1981                                      | 1991          | 2001          | 2008         | 1981-90             | 1991-2000   | 2001-08      | 1981-08     |
| Haryana                | 2205                                      | 3981          | 4636          | 18025        | 8.62                | -0.37       | 22.04        | 5.46        |
| HIP                    | 1249                                      | 2834          | 3333          | 16085        | 12                  | 1.38        | 26.19        | 7.07        |
| J&K                    | 940                                       | 1056          | 971           | 5955         | 1.01                | 1.27        | 29.6         | 2.31        |
| Punjab                 | 3765                                      | 5821          | 7086          | 20924        | 5.58                | 0.63        | 17.17        | 4.76        |
| UP                     | 2040                                      | 3423          | 4007          | 15247        | 7.73                | -1.06       | 23           | 6.13        |
| <b>NW Region</b>       | <b>1136</b>                               | <b>2218</b>   | <b>2492</b>   | <b>10254</b> | <b>6.99</b>         | <b>0.37</b> | <b>23.6</b>  | <b>5.15</b> |
| Assam                  | 172                                       | 942           | 1038          | 3592         | 24.09               | 4.32        | 14.19        | 6.15        |
| Bihar                  | 824                                       | 2059          | 1600          | 6512         | 7.63                | -3.28       | 35.1         | 5.03        |
| Orissa                 | 536                                       | 1144          | 1234          | 5712         | 12.25               | 1.47        | 24.07        | 4.52        |
| WB                     | 1168                                      | 2218          | 3320          | 11825        | 11.12               | 5.36        | 20.39        | 7.33        |
| <b>Eastern Region</b>  | <b>675</b>                                | <b>1591</b>   | <b>1798</b>   | <b>6910</b>  | <b>12.42</b>        | <b>1.65</b> | <b>23.47</b> | <b>5.63</b> |
| Gujarat                | 988                                       | 1904          | 2177          | 7859         | 10.68               | -0.42       | 20.65        | 4.93        |
| MP                     | 464                                       | 1208          | 1883          | 5377         | 12.28               | 0.89        | 17.86        | 7.99        |
| Maharashtra            | 872                                       | 1673          | 2027          | 9321         | 10.67               | 1.03        | 25.65        | 5.9         |
| Rajasthan              | 442                                       | 982           | 1239          | 4437         | 11.62               | 0.44        | 19.04        | 6.52        |
| <b>Central Region</b>  | <b>691</b>                                | <b>1441</b>   | <b>1831</b>   | <b>6749</b>  | <b>11.53</b>        | <b>0.72</b> | <b>21.33</b> | <b>6.2</b>  |
| AP                     | 2329                                      | 3769          | 4348          | 17598        | 7.09                | 2.91        | 23.45        | 5.66        |
| Karnataka              | 1435                                      | 2718          | 3799          | 12361        | 9.75                | 5.23        | 20.98        | 6.44        |
| Kerala                 | 4023                                      | 6740          | 8271          | 84967        | 5.33                | 3.09        | 35.47        | 6.24        |
| Tamil Nadu             | 3632                                      | 7480          | 8677          | 15455        | 11.05               | 1.82        | 15.42        | 6.58        |
| <b>Southern Region</b> | <b>2855</b>                               | <b>5177</b>   | <b>6274</b>   | <b>32595</b> | <b>11.53</b>        | <b>0.72</b> | <b>21.33</b> | <b>6.2</b>  |
| <b>All India</b>       | <b>1239</b>                               | <b>2388</b>   | <b>2779</b>   | <b>11037</b> | <b>9.2</b>          | <b>1.43</b> | <b>23.07</b> | <b>5.91</b> |
| <b>Mean (17)</b>       | <b>1540</b>                               | <b>2867.3</b> | <b>3419.5</b> | <b>15074</b> |                     |             |              |             |
| <b>SDEVP</b>           | <b>1183.7</b>                             | <b>1988.2</b> | <b>2405.1</b> | <b>18222</b> |                     |             |              |             |
| <b>CV</b>              | <b>0.77</b>                               | <b>0.69</b>   | <b>0.7</b>    | <b>1.21</b>  |                     |             |              |             |

Source: Statistical Statement Related to Banks and Report on Currency and Finance, RBI.

The trend of agricultural growth rate across the 17 major states is shown in the Table 3.7. Chhattisgarh, Jharkhand and Uttarakhand have also been included in their parent states. The coefficient of variation (CV) is worked out and gave inequality in the distribution of agricultural credit across the states. The coefficient of variation which declined to 0.70 in 2001 from 0.77 in 1981, has increased to 1.21 percent during the revival period. Looking at the Table, it can be observed that the states below all India PHC particularly Assam, Bihar, Himachal Pradesh and central region which include

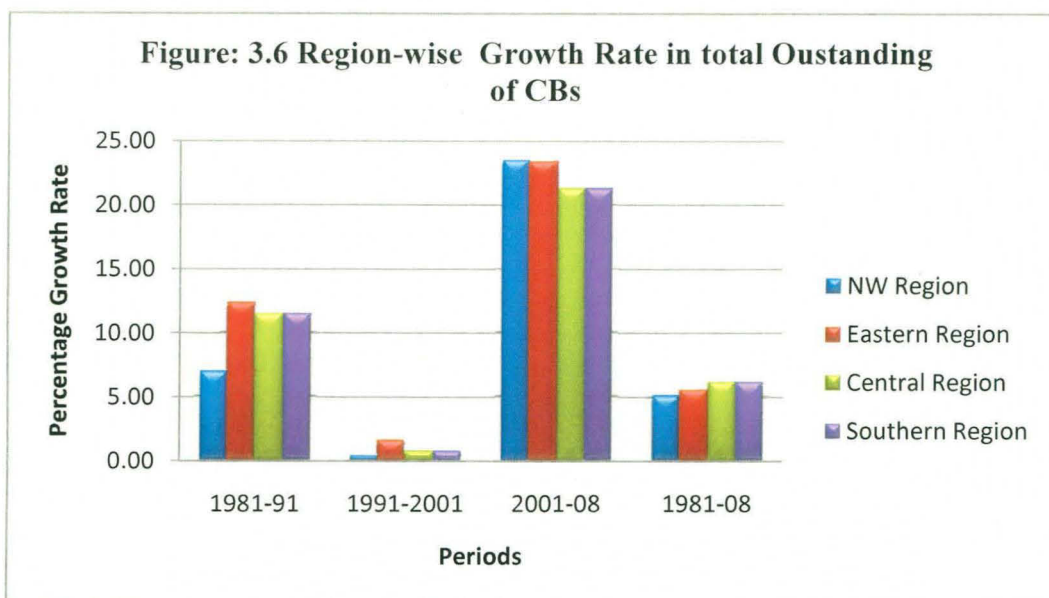
M.P, Maharashtra, and Rajasthan and to some extent Gujarat also have witnessed healthy growth rate in loan outstanding per hectare in the period 1981-1990. Most impressive performance was that of Assam with 24.09 percent growth in the period 1981-1990 thereby leading to the credit per hectare from Rs172 to Rs 942. Along with this, the developed states have also registered high growth rate in the pre-reform period. At the regional level, the compound annual growth rate was the highest in the Eastern region (12.42 percent) in the corresponding period followed by the Central region (11.53 percent), Southern region (11.05 percent) and North-Western region (6.99 percent). It can be said that the region which were at the bottom of credit per hectare in the year 1981-80 has performed well in the pre-reform period.

In first decade of reform period (1991-2001), the trend became reverse. The pace of deterioration in credit per hectare growth was more in the less developed states viz. Bihar (-3.28 percent), Maharashtra (1.03 percent), M.P (0.89 percent) and Rajasthan (0.44 percent). The so called developed states had also registered low as well as negative growth rate in the pre-reform period. There were four states comprising Haryana (-0.37 percent), U.P (-1.06 percent), Bihar (-3.28 percent) and Gujarat (-0.42 percent) in the period 1991-2008 which had experienced negative growth rate. At the regional level in the corresponding period, the growth rate was around 1.65 percent in the eastern region, followed by central region (0.72 percent), southern region (0.72percent) and NW region (0.37 percent) in the entire four regions. The low level of growth rate was mainly the reversal of the public policy objectives of extending the reach of agricultural credit, providing affordable and timely credit to rural households (specifically the economically vulnerable households) and overcoming historical problems of imperfect and fragmented rural credit markets ( Satish, P. 2573).

However, the distribution of agricultural credit, especially since May 2004, has displayed some response to the concerns about the insufficient flow of credit to agriculture. In the next period (2001- 08) which is called the period of revival for agricultural credit, the growth was more than 20 percent in all the states, except Punjab, M.P, Rajasthan, Assam and Tamil Nadu. The Southern region with 21.3 percent in the given period registered highest growth rate among the four regions. Kerala is the state which has demonstrated 35.47 percent annual compound growth rate in agricultural credit. The objective of doubling of agricultural credit in three



years and provision of short-term credit to farmers at an interest rate of 7 per cent are the outcomes of those policies followed, since May 2004.



Source: *ibid*

In order to bring about the inter-state differences clearly, the states have been grouped into two ranges the highest five and the lowest five, depending on the per hectare of agricultural credit financed by the CBs. In the Table 3.6, ranking of the states in terms of credit per hectare highest five and lowest five has been worked out. It is obvious that the first three periods 1981, 1991 and 2001, the three southern states like Kerala, Tamil Nadu (TN), and Andhra Pradesh including Punjab and Haryana have dominated in PHC. In the year 2008, Himachal Pradesh has replaced Tamil Nadu among the top five states. In the year 1981 per hectare in Kerala was Rs 4023, followed by Punjab (Rs. 3765), Tamil Nadu (Rs. 3632), and Andhra Pradesh (Rs. 2329). In 1991 credit per hectare of Tamil Nadu which was Rs 3632 in 1981, reached Rs 7480 in 1991, Rs 8677 in 2001. At other extreme Assam stood at the bottom level in all the period, except 2001. The four states viz, Punjab, Haryana, Kerala and Andhra Pradesh which were highest in PHC in 1981 remained in that category with just replacing their place with each other over the period. On the hand there are five other states viz, Assam (Rs.172), Rajasthan (Rs. 442), M.P (Rs.464), Orissa (Rs. 536), and Bihar (Rs. 824) which were at the bottom of the PHC in 1981. In 1991 Bihar had been replaced by the state of Jammu and Kashmir in under five of the bottom. The ranking of the states among the lower five in the year 2008 were more or less same as in the 1991-93.



| <b>Table: 3.6 Ranking of States According to CBs Outstanding Credit per hectare(PhC ) in Rs</b> |              |             |              |             |              |             |               |
|---|--------------|-------------|--------------|-------------|--------------|-------------|---------------|
| <b>Highest Five</b>   |              |             |              |             |              |             |               |
| <b>1981</b>   |              | <b>1991</b> |              | <b>2001</b> |              | <b>2008</b> |               |
| Kerala  | <b>4023</b>  | Tamil Nadu  | <b>7480</b>  | Tamil Nadu  | <b>8677</b>  | Kerala      | <b>84967</b>  |
| Punjab  | <b>3765</b>  | Kerala      | <b>6740</b>  | Kerala      | <b>8271</b>  | Punjab      | <b>20924</b>  |
| Tamil Nadu  | <b>3632</b>  | Punjab      | <b>5821</b>  | Punjab      | <b>7086</b>  | Haryana     | <b>18025</b>  |
| AP  | <b>2329</b>  | Haryana     | <b>3981</b>  | Haryana     | <b>4636</b>  | AP          | <b>17598</b>  |
| Haryana   | <b>2205</b>  | AP          | <b>3769</b>  | AP          | <b>4348</b>  | HP          | <b>16085</b>  |
| Average   | 3191         |             | 5558         |             | 6604         |             | 31520         |
| <b>Bottom five</b>  |              |             |              |             |              |             |               |
| <b>1981</b>   |              | <b>1991</b> |              | <b>2001</b> |              | <b>2008</b> |               |
| Bihar   | <b>824</b>   | MP          | <b>1208</b>  | Bihar       | <b>1600</b>  | J&K         | <b>5955</b>   |
| Orissa  | <b>536</b>   | Orissa      | <b>1144</b>  | Rajasthan   | <b>1239</b>  | Orissa      | <b>5712</b>   |
| MP  | <b>464</b>   | J&K         | <b>1056</b>  | Orissa      | <b>1234</b>  | MP          | <b>5377</b>   |
| Rajasthan   | <b>442</b>   | Rajasthan   | <b>982</b>   | Assam       | <b>1038</b>  | Rajasthan   | <b>4437</b>   |
| Assam   | <b>172</b>   | Assam       | <b>942</b>   | J&K         | <b>971</b>   | Assam       | <b>3592</b>   |
| Average   | 488          |             | 1066         |             | 1216         |             | 5015          |
| <b>Difference Between top five and bottom five</b>  |              |             |              |             |              |             |               |
|   | <b>2703.</b> |             | <b>4492.</b> |             | <b>5387.</b> |             | <b>26505.</b> |
|   | <b>2</b>     |             | <b>3</b>     |             | <b>1</b>     |             | <b>0</b>      |
| <b>Percentage Share of the Bottom Five to the Top Five</b>                                      |              |             |              |             |              |             |               |
|   | <b>15.28</b> |             | <b>19.18</b> |             | <b>18.42</b> |             | <b>15.91</b>  |

Source: ibid

A look into the growth rate of credit per hectare reveals an interesting feature. In the immediate pre-reform period, there was healthy growth rate for the state of Assam, MP and Orissa, which were among the five bottom states in terms of PhC ranking. As a result Bihar went out of the five categories, forever. PhC had also improved in Madhya Pradesh coming to the top among the bottom five states in the year 1991. Despite high growth rate in Assam in pre-reform period, the PhC could not come out extreme bottom due to lower growth rate in the latter period. The inequality in the distribution of agricultural credit (measured by coefficient of variation) which was marginally declined in the pre reform period from 0.77 to 0.69 increased to 0.70 in 2001, 1.21 in 2008. In 1981, PhC of 10 states out of 17 was below the all India level of credit per hectare. The number of state under the national average came down to

eight and seven in the year 1991 and 2001, respectively. Even the number of states under national average PHC were not too much in the post-reform period, but the significant increase in the coefficient of variation of 17 major states reveal the mounting share of agricultural credit went to the particular pocket like Haryana, Punjab and Southern region. It is shown in Table 3.8 that the difference of PHC between the top five states and bottom five states increased over the period. It had increased to Rs 4492 in 1991 from Rs 2703 in 1981-83. This figure reached to the Rs 5387 in 2001 and Rs 26505 in 2008. The mounting difference which came up after 2001 might be one reason behind the increase in CV from 0.70 in 2001 to 1.21 in 2006-08. Thus the condition was not much better even after the revival of the credit.

### **3.3.2: Regional Variations and Growth in Agricultural Credit of Regional Rural Banks (RRBs) at 1999-2000 Prices:**

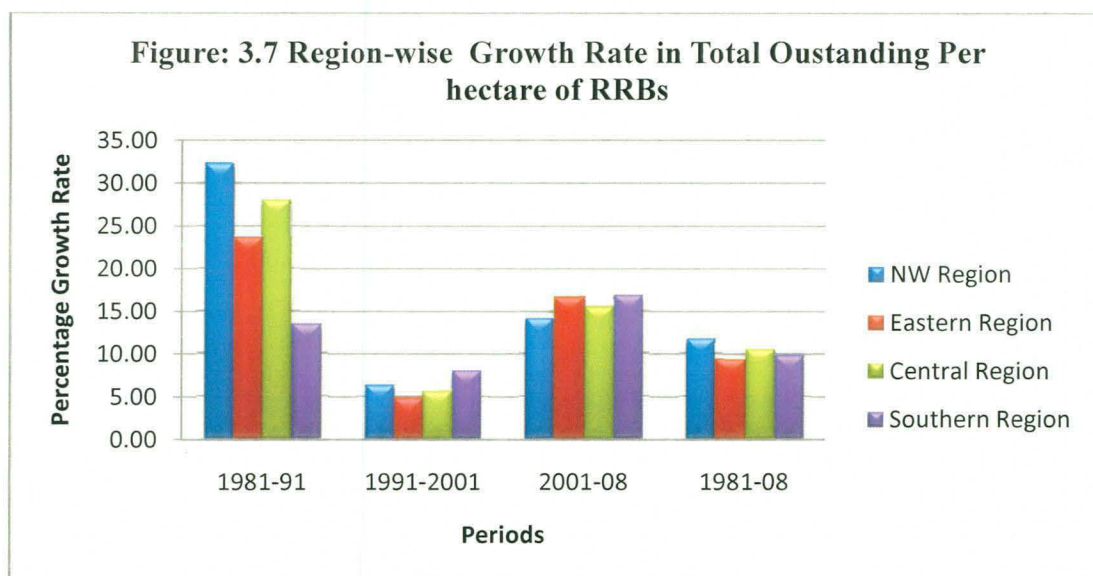
The distribution of agricultural credit by RRBs is shown in Table no 3.7. The decadal growth rate is being calculated for the entire period. At all India average credit per hectare (PHC) of RRBs which was Rs 133 in 1981 increased to Rs 557 in 1991, Rs 1039 in 2001 and Rs 2856 in 2008. The annual growth rate in the immediate pre-reform period was 18.23 percent, 6.34 percent in 1991-2001, and 15.24 percent in 2001-08. The number of states below all India PHC which was seven including Assam, MP, Maharashtra, Gujarat and Punjab in 1981 declined to six in the year 1991. The number again increased to seven in 2001 and came down to six in 2008. But the distribution of loans of RRBs was more or less followed a fair-pattern compare to the commercial banks. The inequality in the distribution of credit (measured by CV) which was 0.99 percent in 1981 declined to 0.65 percent in 2008. It is obvious from Table 3.9 that the inequality have shown great decline in the pre-reform period while in the post reform period it was more or less same. Thus the RRBs unlike CBs have distributed loans across the states in very systematic pattern.

The region-wise growth rate of RRBs outstanding shown in figure 3.9 represents that the North-Western region (NW) which includes Haryana, Himachal Pradesh, J&K, Punjab and UP registered 32.37 percent in PHC in the period 1981-90, followed by, central region (28.82 percent), eastern region (23.71 percent) and southern region (13.47 percent). In post reform period (1991-2001), the growth was not much enthusiastic in the entire region. In the overall period (1981-2008), there was 12.11

percent growth rate in central region, followed by NW region (11.81 percent), southern region (9.93 percent) and eastern region (9.47 percent). Thus in the case of RRBs the growth rate follows less volatile trend across the four regions.

| <b>Table: 3.7 RRBs Outstanding Loan in Rs per hectare of NSA (In Rs) At 1999-2000 prices</b> |  |               |                |                |                     |             |              |              |
|--|--|---------------|----------------|----------------|---------------------|-------------|--------------|--------------|
| State  | Outstanding Loan of RRBs in Rs per hectare |               |                |                | Decadal Growth Rate |             |              |              |
|  | 1981                                       | 1991          | 2001           | 2008           | 1981-90             | 1991-2000   | 2001-08      | 1981-08      |
| Haryana  | 167  | 776           | 1410           | 4134           | 19.97               | 5.73        | 16.64        | 10.55        |
| HP   | 218  | 772           | 2118           | 4800           | 12.02               | 9.45        | 12.62        | 9.73         |
| J&K  | 204  | 891           | 1471           | 4127           | 9.97                | 7.33        | 15.68        | 7.09         |
| Punjab   | 3  | 304           | 449            | 1788           | 100.37              | 4.07        | 20.23        | 23.39        |
| UP   | <b>148</b>                                 | <b>686</b>    | <b>1362</b>    | <b>3712</b>    | <b>19.53</b>        | <b>5.31</b> | <b>6.18</b>  | <b>8.27</b>  |
| <b>NW Region</b>   | <b>166</b>                                 | <b>953</b>    | <b>1583</b>    | <b>4296</b>    | <b>32.37</b>        | <b>6.38</b> | <b>14.27</b> | <b>11.81</b> |
| Assam  | 55   | 722           | 802            | 3014           | 34.87               | 1.34        | 15.39        | 10.83        |
| Bihar  | 261  | 1065          | 1341           | 3422           | 13.82               | 2.38        | 28.63        | 7.09         |
| Orissa   | 281  | 673           | 1433           | 3781           | 13.50               | 7.86        | 15.07        | 7.66         |
| WB   | 109  | 862           | 1409           | 3217           | 23.99               | 6.23        | 10.31        | 9.94         |
| <b>Eastern Region</b>  | <b>177</b>                                 | <b>831</b>    | <b>1246</b>    | <b>3359</b>    | <b>23.71</b>        | <b>4.84</b> | <b>16.73</b> | <b>9.47</b>  |
| Gujarat  | 6  | 161           | 495            | 1310           | 43.81               | 11.58       | 12.73        | 16.86        |
| MP   | 52   | 320           | 761            | 1587           | 23.21               | 5.85        | 10.10        | 10.57        |
| Maharashtra  | 15   | 161           | 296            | 620            | 35.63               | 5.06        | 10.06        | 11.91        |
| Rajasthan  | 97   | 196           | 560            | 1678           | 12.65               | 11.59       | 15.86        | 9.08         |
| <b>Central Region</b>  | <b>43</b>                                  | <b>209</b>    | <b>528</b>     | <b>1299</b>    | <b>28.82</b>        | <b>8.52</b> | <b>12.19</b> | <b>12.11</b> |
| AP   | 294  | 903           | 1749           | 5236           | 15.37               | 6.42        | 15.67        | 9.78         |
| Karnataka  | 153  | 731           | 1762           | 4659           | 19.94               | 10.10       | 13.43        | 10.58        |
| Kerala   | 776  | 1937          | 4019           | 11307          | 12.67               | 6.76        | 17.14        | 8.94         |
| Tamil Nadu   | 149  | 237           | 577            | 2376           | 5.84                | 9.04        | 21.41        | 10.43        |
| <b>Southern Region</b>   | <b>343</b>                                 | <b>952</b>    | <b>2026</b>    | <b>5894</b>    | <b>13.46</b>        | <b>8.08</b> | <b>16.91</b> | <b>9.93</b>  |
| <b>All India</b>   | <b>133</b>                                 | <b>557</b>    | <b>1039</b>    | <b>2856</b>    | <b>18.23</b>        | <b>6.34</b> | <b>15.24</b> | <b>9.38</b>  |
| <b>Mean( 17)</b>   | <b>176.92</b>                              | <b>686.06</b> | <b>1307.80</b> | <b>3608.94</b> |                     |             |              |              |
| <b>SDEVP</b>   | <b>175.15</b>                              | <b>433.25</b> | <b>861.44</b>  | <b>2337.53</b> |                     |             |              |              |
| <b>CV</b>  | <b>0.99</b>                                | <b>0.63</b>   | <b>0.66</b>    | <b>0.65</b>    |                     |             |              |              |

Source: Calculated from Statistical Statement Relating Cooperative, NABARB.



Source: *ibid*

The ranking of the states according to agricultural credit per hectare of RRBs has been worked out in Table 3.8. Among the highest five states in 1981, Kerala comes to the first position with Rs 776 PHC , followed by Andhra Pradesh (Rs 294), Orissa (Rs281), Bihar( Rs 261) and Himachal Pradesh(Rs 218). One of the most interesting features is that Orissa and Bihar which was among the bottom five in case of CBs comes to the top five in PHC of RRBs. While among the bottom five, Punjab was at the lowest place with Rs 3 PHC , followed by Gujarat (Rs 6), Maharashtra (Rs 15), MP(Rs 52) and Assam(Rs 55). Tamil Nadu has also come into the category of five bottom states after replacing MP in the year 1991. Thus the so called well-developed states like Punjab, Gujarat and Tamil Nadu which were among top five of CBs PHC have received very less amount of agricultural credit supplied by RRBs. Thus the priority of RRBs was much different from the commercial banks. On the one hand, CBs were biased to the less-developed states by giving them very less amount of credit. Whereas RRBs compare to the CBs have followed more or less fair policy of credit distribution. The difference between the average credit per hectare of the top five states and bottom five states increased from Rs 339 in 1981 to Rs 937, Rs 1770 and Rs 4662 in the year 1991, 2001 and 2008, respectively. The percentage share of the bottom five to the highest five in the corresponding period has also increased Rs 7, Rs 18, Rs 21 and Rs 23. But increment in the percentage share of the bottom five to the top five was quite low for RRBs compare to CBs.

| <b>Table: 3.8 Ranking of States According to the RRBs Outstanding Credit per hectare(PHC ) in Rs.</b> |              |             |              |             |               |             |               |
|---|--------------|-------------|--------------|-------------|---------------|-------------|---------------|
| <b>Highest Five</b>   |              |             |              |             |               |             |               |
| <b>1981</b>   |              | <b>1991</b> |              | <b>2001</b> |               | <b>2008</b> |               |
| Kerala  | 776          | Kerala      | 1937         | Kerala      | 4019          | Kerala      | 11307         |
| AP  | 294          | Bihar       | 1065         | HP          | 2118          | AP          | 5236          |
| Orissa  | 281          | UP          | 953          | KR          | 1762          | HP          | 4800          |
| Bihar   | 261          | AP          | 903          | AP          | 1749          | KR          | 4659          |
| HP  | 218          | J&K         | 891          | UP          | 1583          | UP          | 4296          |
| <b>Average</b>  | <b>366</b>   |             | <b>1150</b>  |             | <b>2246</b>   |             | <b>6060</b>   |
| <b>Bottom five</b>  |              |             |              |             |               |             |               |
| <b>1981</b>   |              | <b>1991</b> |              | <b>2001</b> |               | <b>2008</b> |               |
| Assam   | 55           | PU          | 304          | TN          | 577           | PU          | 1788          |
| MP  | 52           | TN          | 237          | Rajasthan   | 560           | Rajasthan   | 1678          |
| MH  | 15           | Rajasthan   | 196          | GUJ         | 495           | MP          | 1587          |
| GUJ   | 6            | MH          | 161          | PU          | 449           | GUJ         | 1310          |
| PU  | 3            | GUJ         | 161          | MH          | 296           | MH          | 620           |
| <b>Average</b>  | <b>26</b>    |             | <b>212</b>   |             | <b>475</b>    |             | <b>1397</b>   |
| <b>Difference Between top five and bottom five</b>  |              |             |              |             |               |             |               |
|   | <b>339.8</b> |             | <b>937.7</b> |             | <b>1770.7</b> |             | <b>4662.8</b> |
| <b>Percentage Share of the Bottom Five to the Top Five</b>  |              |             |              |             |               |             |               |
|   | <b>7.23</b>  |             | <b>18.43</b> |             | <b>21.16</b>  |             | <b>23.05</b>  |

Source: Table 3.7

### **3.3: Regional Variations and Growth of Agricultural Credit in Cooperatives at 1999-2000 Prices:**

If we make comparison between Cooperatives and Commercial Banks (CBs), we find that the regional variation across the states was higher for PHC of co-operatives than that of CBs (the CV of PHC was 0.89 in 1981-83, 1.38 in 1991-93, 1.37 in 2001-03 and 1.52 in 1.52 in 2006-8(See Table 3.9). Thus in the immediate pre-reform period the inequality in the distribution of agricultural credit by cooperatives came down. But in the latter period it had registered slight decline in the first decade of reform period and the regional variation (measured by CV) in across the seventeen major states again reached 1.52 percent in 2008. The per hectare outstanding loans disbursed by the cooperatives increased from Rs 905 in the year 1981, to Rs 3377 in 2008 which meant it registered 5.57 percent growth rate in the same period. It is obvious from the Table 3.10, there are six states comprising Jammu and Kashmir, Uttar Pradesh and four state of eastern region which registered negative growth rate in the pre-reform

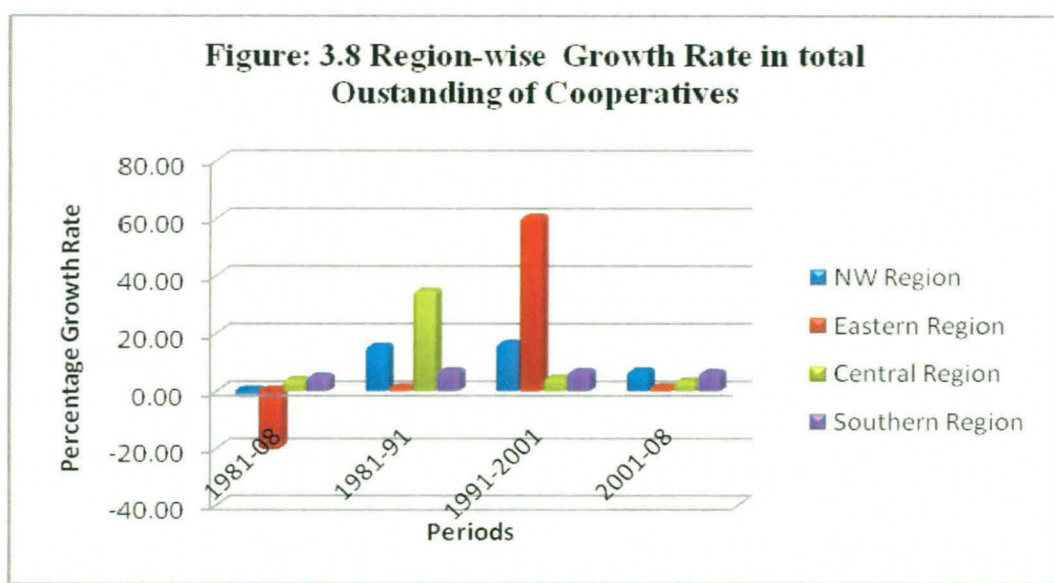
period (1981-90). In the eastern region, it was -48.46 percent in West Bengal followed by Assam (-32.43 percent), Orissa (-2.82 percent) and Bihar (-0.04 percent). Looking at the regional level, it was borne out from the Table 3.10 that there are two regions comprising eastern region and NW region which registered the negative growth rate. The annual average growth rate of cooperative credit per hectare in the pre-reform period had registered -20.9 percent in the eastern region, followed by NW region (-2.75 percent). On the other hand, the PHC growth rate of cooperatives in the same period was in 5.31 percent in the Southern region, followed by the Central region (4.08 percent).

| <b>Table: 3.9 Outstanding loans of Cooperatives per hectare and Annual growth rate</b> |  |             |             |              |                     |              |              |             |
|--|--|-------------|-------------|--------------|---------------------|--------------|--------------|-------------|
| State  | Outstanding Loan of Cooperatives per hectare |             |             |              | Decadal Growth Rate |              |              |             |
|  | 1981   | 1991        | 2001        | 2008         | 1981-90             | 1991-2000    | 2001-08      | 1981-08     |
| Haryana  | 1569   | 1608        | 4340        | 8983         | 0.76                | 11.25        | 9.72         | 7.45        |
| HP   | 1291   | 1197        | 1741        | 4516         | 4.46                | 4.15         | 12.21        | 3.96        |
| J&K  | 631  | 177         | 642         | 6663         | -21.21              | -15.61       | 45.63        | 15          |
| Punjab   | 1618   | 2382        | 2976        | 6942         | 4.88                | 3.47         | 11.24        | 4.78        |
| UP   | 837  | 2105        | 653         | 996          | -2.66               | 75.2         | 4.79         | 4.87        |
| <b>NW Region</b>   | <b>1189</b>                                  | <b>1494</b> | <b>2070</b> | <b>5620</b>  | <b>-2.75</b>        | <b>15.69</b> | <b>16.72</b> | <b>7.21</b> |
| Assam  | 136  | 257         | 37          | 16           | -32.43              | -41.28       | 52.62        | -2.36       |
| Bihar  | 266  | 373         | 264         | 727          | -0.04               | -60.13       | 175.59       | -8.51       |
| Orissa   | 867  | 436         | 1466        | 4583         | -2.82               | 10.84        | 11.78        | 6.31        |
| WB   | 855  | 457         | 1145        | 2366         | -48.46              | 95.41        | 2.47         | 10.14       |
| <b>Eastern Region</b>  | <b>531</b>                                   | <b>381</b>  | <b>728</b>  | <b>1923</b>  | <b>-20.94</b>       | <b>1.21</b>  | <b>60.61</b> | <b>1.4</b>  |
| Gujarat  | 1362   | 1406        | 1800        | 3175         | 3.63                | 3.37         | 7.03         | 3.29        |
| MP   | 501  | 608         | 966         | 1151         | 4.55                | 92.2         | 0.29         | 4.48        |
| Maharashtra  | 1015   | 1585        | 1921        | 3826         | 6.91                | 0.27         | 7.26         | 4.54        |
| Rajasthan  | 468  | 326         | 470         | 1222         | 1.24                | 43.4         | 4.08         | 2.13        |
| <b>Central Region</b>  | <b>837</b>                                   | <b>982</b>  | <b>1289</b> | <b>2344</b>  | <b>4.08</b>         | <b>34.81</b> | <b>4.67</b>  | <b>3.61</b> |
| AP   | 837  | 853         | 1864        | 3794         | 3.94                | 6.17         | 6.99         | 7.16        |
| Karnataka  | 825  | 761         | 1239        | 2181         | 2.17                | 5.67         | 5.99         | 4.13        |
| Kerala   | 4884   | 9698        | 14851       | 40629        | 9.32                | 3.2          | 12.11        | 7.29        |
| Tamil Nadu   | 1809   | 2328        | 6243        | 10277        | 5.8                 | 13.84        | 2.76         | 7.81        |
| <b>Southern Region</b>   | <b>2089</b>                                  | <b>3410</b> | <b>6049</b> | <b>14220</b> | <b>5.31</b>         | <b>7.22</b>  | <b>6.96</b>  | <b>6.6</b>  |
| <b>All India</b>   | <b>905</b>                                   | <b>857</b>  | <b>2065</b> | <b>3377</b>  | <b>2.86</b>         | <b>12.71</b> | <b>5.28</b>  | <b>5.57</b> |
| <b>Mean( 17)</b>   | <b>1163</b>                                  | <b>1562</b> | <b>2507</b> | <b>6003</b>  |                     |              |              |             |
| <b>SDEVP</b>   | <b>1037</b>                                  | <b>2156</b> | <b>3437</b> | <b>9114</b>  |                     |              |              |             |
| <b>CV</b>  | <b>0.89</b>                                  | <b>1.38</b> | <b>1.37</b> | <b>1.52</b>  |                     |              |              |             |

Source: Calculated from Statistical Statement Relating Cooperative, NABARB and National Federation of State Cooperative Banks Ltd (NAFSCOB) (2002-2008).



The trend had come into reverse direction with healthy growth rate in those states which demonstrated negative growth rate in the pre-reform period, exception being Jammu & Kashmir, Assam and Bihar. For example, Orissa and West Bengal which show negative growth rate in PHC in the pre-reform period registered 10.84 percent and 95.41 percent, respectively in the period 1991-2001. Other two states of the eastern region like Bihar and Assam which were experiencing negative growth rate in pre-reform(1981-90) and post reform period (1991-2000), went out from the grip of negative growth rate in PHC of cooperatives in the period 2001-08. Even after revival of agricultural credit, it is really warning situation as especially given the fact that some of the main centres of agricultural growth such as West Bengal, U.P have witnessed low growth rates in loan outstanding PHC of cooperatives.



Source: *ibid.*

The ranking of the states according to their PHC have been worked out in Table 3.10. The ranking of the highest five and lowest five, even in case of cooperatives, is not much different from the ranking in case of CBs PHC . The well developed agriculturally developed states like Punjab and Haryana and two states from the southern region such as Kerala and Tamil Nadu were among the highest five in all the year taken into the study. While at the bottom level, there were Assam (Rs 136), Bihar (Rs 266), Rajasthan (Rs 468), M.P (Rs 501) and J&K (Rs 631) in the year 1981. Per hectare outstanding of credit was higher in well developed states and lower in the

poor states. There was not much difference in the ranking of the states in all the year exception being Jammu and Kashmir which was among the lowest five in the first two year jumped into the category of the highest five states with Rs 6663 PHC in the year 2008.

| Table: 3.10 Ranking of States According to the Cooperatives Outstanding Credit per hectare(PHC ) in Rs. |       |           |      |           |       |           |       |
|---|-------|-----------|------|-----------|-------|-----------|-------|
| Highest Five  |       |           |      |           |       |           |       |
| 1981  |       | 1991      |      | 2001      |       | 2008      |       |
| Kerala  | 4884  | Kerala    | 9698 | Kerala    | 14851 | Kerala    | 40629 |
| TN  | 1809  | PU        | 2382 | TN        | 6243  | TN        | 10277 |
| PU  | 1618  | TN        | 2328 | HR        | 4340  | HR        | 8983  |
| HR  | 1569  | HR        | 1608 | PU        | 2976  | PU        | 6942  |
| GUJ   | 1362  | MH        | 1585 | MH        | 1921  | J&K       | 6663  |
| Average   | 2248  |           | 3520 |           | 6066  |           | 14699 |
| Bottom five   |       |           |      |           |       |           |       |
| 1981  |       | 1991      |      | 2001      |       | 2008      |       |
| J&K   | 631   | OR        | 436  | UP        | 653   | Rajasthan | 1222  |
| MP  | 501   | BH        | 373  | J&K       | 642   | MP        | 1151  |
| Rajasthan   | 468   | Rajasthan | 326  | Rajasthan | 470   | UP        | 996   |
| BH  | 266   | Assam     | 257  | BH        | 264   | BH        | 727   |
| Assam   | 136   | J&K       | 177  | Assam     | 37    | Assam     | 16    |
| Average   | 400   |           | 314  |           | 413   |           | 822   |
| Difference Between top five and bottom five   |       |           |      |           |       |           |       |
|   | 1848  |           | 3207 |           | 5653  |           | 13876 |
| Percentage Share of the Bottom Five to the Top Five   |       |           |      |           |       |           |       |
|   | 17.81 |           | 9.99 |           | 6.79  |           | 5.59  |

Source: *ibid.*

It is obvious from the Table 3.10, the difference between the highest five and lowest five which was Rs 1848 on PHC in 1981 increased to Rs 3207 in 1991, Rs 5653 in 2001 and Rs 13873 in 2008. Thus the differences between the highest five and lowest five states in PHC had gone up in both case SCBs and cooperatives over the period. One of the important aspect that need to be pointed out is that the percentage of the bottom five to the highest five in case of cooperatives was declined to 5.59 percent in 2006-08 from 17.81 percent in the year 1981. In spite of this, the inequality in the distribution of loan outstanding per hectare of cooperatives increased more than commercial banks. Thus it must be noted that the regional inequality created by the cooperatives over the period had been overcome by the commercial banks to the some extent.



From the above discussion, it is observed that the agricultural credit has increased only in few states and thus it has failed in bridging the regional rural gaps and in fact has increased it. Performance of CBs has been more effective than in the case of cooperatives, which is demonstrated by the fact the PHC outstanding have demonstrated relatively higher growth rate compared to cooperatives.

## **Chapter: 4**

### **Factors Influencing the Flow of Institutional Credit to Agriculture:**

#### **A State-wise Analysis**

Since the beginning of the green revolution in India, the demand for credit in the agricultural sector has increased by leaps and bounds. In order to match the rising demand with the supply of agricultural credit, the formal sources of credit with the multi-agency approach had been encouraged. Despite many efforts made in the direction of agricultural credit, the regional variations have increased over the period. The skewed distribution of agricultural credit does not only exist at the regional level but also across the different classes of the farmers. In this chapter, an attempt is made to find out the factors which influence the supply of agricultural credit from formal sources. Literature indicates that cropping intensity (percentage of net sown area to gross cropped area), irrigation intensity (percentage of gross irrigated area to gross cropped area), percentage of area under non-food crops (ANFC), and consumption of fertilizers per hectare (CF) are the important determinants of agricultural credit at all India. The agricultural credit in turn influences the growth of farm income. This chapter aims to test this relationship at the state level from 1981 to 2008. The chapter is divided into two sections, the first section deals with formulation of hypotheses regarding the possible influence of each variable on farm credit and explain the empirical results. Section two presents results on the impact of agricultural credit on agricultural GDP at all India.

#### **4.1: Determinants of Agricultural Credit:**

In order to trace the determinants of agricultural credit, multiple regressions has been used in the study. Following are the dependent and independent variables and their expected relationship:

#### **Dependent Variable(Y): Agricultural credit (CBs, RRBs and Cooperatives) per hectare**

Total outstanding agricultural credit per hectare (net sown area) supplied by SCBs is taken as dependent variable. The agricultural credit has been used in the real terms

adjusted with the GDP deflator at 1999-2000 prices. In order to work out credit per hectare the net sown area (NSA) has been preferred over the gross cropped area (GCA) because of two reasons. Firstly, the NSA is more stable than GCA and secondly and more importantly, the cropping intensity has been taken as explanatory variable. The GCA could not be taken to standardise agricultural credit because GCA itself is the product net sown area and intensity of cultivation.

### **Explanatory Variables:**

#### **I. Cropping Intensity (X1, CI):**

Cropping intensity is the percentage of gross cropped area to the net sown area. It shows the intensity of cultivation among the farmers. Increase in cropping intensity means an increase in agricultural activities and consequently increase in the demand for credit. Correlation matrices show that the agricultural credit and the cropping intensity are positively related in all seventeen states.

#### **II. Percentage of Area under Non-Food Crops (X2, ANFC):**

Percentage of area under non-food crops has been taken as another important factor influencing institutional credit. The cropping pattern may influence the demand for the agricultural credit. The area under non-food crops or cash crops might be the attraction for the banks due to high profit value. In order to avoid risk associated with the traditional agriculture, the banks may go into those regions which are concentrated on the cash crops. It is borne out from the Table 4.1 that area under non-food crops is not significantly correlated in all the states. It shows that there are different cropping pattern across the states. The significant correlation between ANFC and agricultural credit is in Punjab, Assam, Gujarat, West Bengal, Madhya Pradesh, Rajasthan, Andhra Pradesh, Karnataka and Tamil Nadu.

#### **III. Irrigation Intensity or Percentage of Gross Irrigated Area to Gross Cropped Area (X3, II):**

The third variable taken up is the irrigation intensity which means the percentage of gross irrigated area to the gross cropped area. Irrigation intensity is not only affecting the agricultural production but also has much wider influence. The factors like area under irrigation, value of agricultural output, expenditure on inputs (fertiliser and pesticides) are the important variables that determine the amount of credit obtained (Sahu, 2002). It is well informed that the SCBs provide the larger share of

agricultural credit to the irrigated areas to avoid high risk and repayment problem associated with agriculture. The correlations matrix shows that there are positive and significant association between agricultural credit and irrigation intensity.

| <b>Table: 4.1 State-wise correlation between SCBs credit per hectare and the determinants of agricultural credit (1981-2008)</b> |                        |                               |                          |  |
|--|------------------------|-------------------------------|--------------------------|--|
|  | Cropping Intensity(X1) | Area under Non-food Crops(X2) | Irrigation Intensity(X3) | Consumption of Fertilizers per hectare(X4) |
| Haryana  | .635**                 | 0.35                          | .539**                   | .603**                                     |
| Himachal Pradesh   | .658**                 | 0.366                         | .535**                   | .588**                                     |
| Jammu & Kashmir  | .412 <sup>†</sup>      | -0.029                        | 0.175                    | 0.275                                      |
| Punjab   | .682**                 | 0.371                         | .560**                   | .617**                                     |
| Uttar Pradesh  | .665**                 | 0.366                         | .542**                   | .624**                                     |
| Assam  | .585**                 | .426 <sup>†</sup>             | .560**                   | .676**                                     |
| Bihar  | .385 <sup>†</sup>      | 0.211                         | 0.305                    | .394 <sup>†</sup>                          |
| Orissa   | .515**                 | 0.288                         | 0.369                    | .550**                                     |
| West Bengal  | .720**                 | .393 <sup>†</sup>             | .579**                   | .632**                                     |
| Gujarat  | .594**                 | 0.359                         | .538**                   | .626**                                     |
| Madhya Pradesh   | .750**                 | .423 <sup>†</sup>             | .610**                   | .623**                                     |
| Maharashtra  | .622**                 | 0.336                         | .518**                   | .610**                                     |
| Rajasthan  | .654**                 | .416 <sup>†</sup>             | .611**                   | .629**                                     |
| Andhra Pradesh   | .649**                 | 0.352                         | .534**                   | .615**                                     |
| Karnataka  | .696**                 | 0.372                         | .576**                   | .655**                                     |
| Kerala   | .458 <sup>†</sup>      | 0.178                         | 0.367                    | .505**                                     |
| Tamil Nadu   | .710**                 | .485**                        | .599**                   | .631**                                     |
| All India  | .653**                 | 0.366                         | .546**                   | .627**                                     |
| ** Correlation is significant at the 0.01 level (2-tailed).  |                        |                               |                          |  |
| * Correlation is significant at the 0.05 level (2-tailed).   |                        |                               |                          |  |

Source: Worked out from the various issues of Fertilizers Statistics, Statistical Statement Relating to Cooperative Movement, and Statistical Tables Relating to Banks.

#### **IV. Consumption of Fertilizers per Hectare (CF, X4):**

Fertilizer has become one of the important inputs in agriculture since the Green revolution. In order to justify the association of agricultural credit with consumption of fertilizers, the correlation matrices have been worked out in Table 4.1. This shows that there is significant association of agricultural credit with the consumption of fertilizers in all the states except Jammu and Kashmir. Literature also indicates that the consumption of fertilizers had significantly affected the agricultural credit supplied by the SCBs (Paul, 1994, Bhalla, 2010, Nasir, and Singh, 2003 Subbarao,

1980, Gadgil, 1986). It is hypothesised that the consumption of fertilizers has positive impact on the agricultural credit supplied by institutional sources.

#### **4.2: State-wise Results based on Regression Analysis**

It has been observed in the previous chapter that there are substantial inter-state differences in institutional credit per hectare. In this section an attempt has been made to examine the factors which contribute to the variations in credit per hectare (NSA) across the states. The agricultural credit comprising of total outstanding loans by the commercial banks, Regional Rural Banks (RRBs) and cooperatives for the 28 year period prevailing from 1980 to 2008 has been used as the dependent variables. Hence, credit per hectare of net sown area (NSA) is the dependent variable in the analysis. There are four explanatory variables like percentage of net sown area to gross cropped area or cropping intensity, percentage of area under non-food crops, percentage of gross irrigated area to gross cropped area or irrigation intensity and consumption of fertilizers per hectare. In order to cover the impact of economic reforms on agricultural credit, a dummy variable has been used. The a priori model on the determinants of supply of agricultural credit has been specified with the following variables.

$$\ln\text{PHC} = \beta_0 + \beta_1 \ln\text{CI} + \beta_2 \ln\text{ANFC} + \beta_3 \ln\text{II} + \beta_4 \ln\text{FC} + u \dots \quad (4.1)$$

Where

$\ln\text{PHC}$  = natural logarithm of dependent variable which is the per hectare credit (PHC) supplied by the SCBs, RRBs and Cooperatives (at 1999-2000 prices).

While CI, ANFC, II and FC are the explanatory variables.

$\ln\text{CI}$  = natural logarithm of cropping intensity (CI)

$\ln\text{ANFC}$  = natural logarithm of the cropping pattern measured by Percentage of area under non-food crops (ANFC)

$\ln\text{II}$  = natural logarithm of percentage of gross irrigated area to the gross cropped area or irrigation intensity (II)

$\ln\text{FC}$  = natural logarithm of consumption of fertilizers per hectare gross cropped area (in Kg PH).

$\beta_1, \beta_2, \beta_3, \beta_4$  are their respective slope coefficient,  $\beta_0$  is intercept and  $u$  is the error term.

Prais-Winsten transformation regression has been used to avoid the problem of autocorrelation which exist in most of the time series data.

Table 4.2 presents co-efficient or elasticity of credit estimated for seventeen major states. In the state of Haryana, OLS has been applied without transformation of the function. In Model-1 of Haryana, it can be observed that cropping intensity (CI), area under non-food crops (ANFC), and irrigation intensity (II,) have positive and significant effect on agricultural credit supplied by institutional sources. The coefficient of CI, ANFC and II are 7.70, 1.04 and 1.75, respectively. It implies that for a percent change in the cropping intensity, agricultural credit per hectare increased by 7.7 percent, holding other variables constant. Whereas the elasticity of credit in the case of ANFC shows that for one percent increase in area under non-food crops(ANFC) will bring about 1.04 percent increase in the agricultural credit. Adjusted R-squared for the model is 0.78, which means log of the variables included in the model are able to explain 0.70 percent variations of the log of agricultural credit over the period 1981-2008. Alternative models have been tested after dropping those variables which are highly correlated with each other. It can be observed from the model 3 of Haryana that consumption of fertilizers which is insignificant in the first model becomes statistically significant in the second model.

After testing the various alternative models, there is one model which is significant in Himachal Pradesh. It can be observed that cropping intensity and irrigation intensity are become statistically significant in model 1. It implies that an increase in one percent in the cropping intensity will bring about 9.44 percent in agricultural credit. Whereas the elasciticity of credit irrigation intensity is 4.63 which implies that one percent increase in irrigation intensity increases the agricultural credit by 4.63 percent. The adjusted R square shows that the model1 of Himachal Pradesh explains about 70 percent variations

**Table: 4.2 OLS Estimates for Institutional Credit (1981-2008)**

| Haryana                         |                 |         |                |         |                |         |
|---------------------------------|-----------------|---------|----------------|---------|----------------|---------|
|                                 | Model 1         |         | Model 2        |         | Model 3        |         |
| Variables                       | $\beta$ -value  | t-value | $\beta$ -value | t-value | $\beta$ -value | t-value |
| Constant                        | <b>-41.26*</b>  | -5.36   | <b>-41.44*</b> | -5.1    | -2.32          | -0.65   |
| Dummy                           | <b>-0.85*</b>   | -3.29   | -0.7           | -2.49   | -0.13          | -0.44   |
| Cropping Intensity              | <b>7.70*</b>    | 5.42    | <b>8.85*</b>   | 6.08    |                |         |
| Area Under Non-food Crops       | <b>1.04***</b>  | 1.89    | <b>1.69**</b>  | 2.98    |                |         |
| Irrigation intensity            | <b>1.75**</b>   | 2.67    |                |         | <b>2.10**</b>  | 2.28    |
| Consumption of fertilizers/hect | 0.09            | 0.39    |                |         | 0.52           | 1.65    |
| R <sup>2</sup>                  | <b>0.78</b>     |         | <b>0.68</b>    |         | <b>0.54</b>    |         |
| DW                              | <b>0.93</b>     |         | <b>1.02</b>    |         | <b>0.47</b>    |         |
| DW*                             |                 |         |                |         |                |         |
| Himachal Pradesh                |                 |         |                |         |                |         |
|                                 | Model 1         |         | Model 2        |         |                |         |
| Variables                       | $\beta$ -value  | t-value | $\beta$ -value | t-value |                |         |
| Constant                        | <b>-54.78**</b> | -2.3    | 83.39**        | -3.84   |                |         |
| Dummy                           | -0.27           | -1.13   | -0.34          | -1.24   |                |         |
| Cropping Intensity              | <b>9.44**</b>   | 1.96    | <b>17.80*</b>  | 4.18    |                |         |
| Area Under Non-food Crops       | -0.05           | -0.19   | 0.37           | 1.68    |                |         |
| Irrigation intensity            | <b>4.63***</b>  | 1.77    |                |         |                |         |
| Consumption of fertilizers/hect | 0.54            | 1.22    |                |         |                |         |
| R <sup>2</sup>                  | 0.7             |         | 0.62           |         |                |         |
| DW                              | <b>1.05</b>     |         | <b>1.08</b>    |         |                |         |
| DW*                             |                 |         |                |         |                |         |
| Jammu & Kashmir                 |                 |         |                |         |                |         |
|                                 | Model 1         |         | Model 3(P-W)   |         | Punjab Model 1 |         |
| Variables                       | $\beta$ -value  | t-value | $\beta$ -value | t-value | $\beta$ -value | t-value |
| Constant                        | 3.57            | 0.14    | 1.23           | 0.11    | -27.92         | -1.9    |
| Dummy                           | -0.22           | -0.6    | -0.11          | -0.43   | -0.04          | -0.16   |
| Cropping Intensity              | <b>1.20*</b>    | 3.25    | <b>1.05*</b>   | 7.15    | -0.38          | -0.17   |
| Area Under Non-food Crops       | -0.21           | -0.39   | -0.2           | -0.74   | 0.15           | 0.29    |
| Irrigation intensity            | -1.53           | -0.22   | 0.67           | 0.22    | <b>7.26**</b>  | 2.7     |
| Consumption of fertilizers/hect | <b>1.28*</b>    | 3.48    | 0.01           | 0.05    | <b>1.12**</b>  | 2.55    |
| R <sup>2</sup>                  | 0.4             |         | 0.75           |         | 0.62           |         |
| DW                              | <b>0.79</b>     |         | <b>0.79</b>    |         | 0.67           |         |
| DW*                             |                 |         | <b>1.33</b>    |         |                |         |

Continued.....

| Variables                       | Uttar Pradesh(P-W) |             |                |         | Assam(P-W)     |         |
|---------------------------------|--------------------|-------------|----------------|---------|----------------|---------|
|                                 | Model 1            |             | Model 2        |         | Model 3        |         |
|                                 | $\beta$ -value     | t-value     | $\beta$ -value | t-value | $\beta$ -value | t-value |
| Constant                        | 17.36              | 1.23        | -9.45          | -0.8    | -0.2           | -0.09   |
| Dummy                           | -0.05              | -0.3        | 0.04           | 0.18    | -0.21          | -0.78   |
| Cropping Intensity              | -3.35              | -1.28       | 1.6            | 0.77    | <b>0.93*</b>   | 3.59    |
| Area Under Non-food Crops       | 0.13               | 0.56        | -0.03          | -0.12   | <b>0.69**</b>  | 2.04    |
| Irrigation intensity            | 0.94               | 0.99        | <b>2.45**</b>  | 2.61    | -0.09          | -0.42   |
| Consumption of fertilizers/hect | <b>0.79*</b>       | 3.28        |                |         | <b>0.44*</b>   | 2.08    |
| R <sup>2</sup>                  | 0.9                |             | 0.52           |         | <b>0.76</b>    |         |
| DW                              | 1.24               |             | 0.68           |         | 1.19           |         |
| DW*                             | 1.79               |             | 1.78           |         | <b>1.97</b>    |         |
| Variables                       | Bihar(P-W)         |             | Orissa(P-W)    |         |                |         |
|                                 | Model 1            |             | Model 1        |         | Model 2        |         |
|                                 | $\beta$ -value     | t-value     | $\beta$ -value | t-value | $\beta$ -value | t-value |
| Constant                        | -1.62              | -1.09       | 0.42           | 0.3     | 5.63           | 4.11    |
| Dummy                           | 0.01               | 0.05        | -0.23          | -1.52   | -0.2           | -0.68   |
| Cropping Intensity              | <b>0.98*</b>       | 19.21       | <b>0.87*</b>   | 7.59    |                |         |
| Area Under Non-food Crops       | -0.05              | -0.37       | 0.13           | 1.11    | <b>0.37***</b> | 1.7     |
| Irrigation intensity            | 0.84               | 1.91        | <b>0.73**</b>  | 2.59    |                |         |
| Consumption of fertilizers/hect | 0.46               | 3.08        | 0.3            | 1.18    | 0.51           | 1.39    |
| R <sup>2</sup>                  | 0.96               |             | 0.85           |         | 0.74           |         |
| DW                              | 0.51               |             | 1.02           |         | 1.07           |         |
| DW*                             | 1.53               |             | 1.59           |         | 2.03           |         |
| Variables                       | West Bengal(P-W)   |             | Gujarat(P-W)   |         | M.P (P-W)      |         |
|                                 | Model 1            |             | Model 2        |         | Model 3        |         |
|                                 | $\beta$ -value     | t-value     | $\beta$ -value | t-value | $\beta$ -value | t-value |
| Constant                        | <b>2.3</b>         | <b>1.81</b> | -1.4           | -0.45   | -0.03          | 0       |
| Dummy                           | -0.15              | -1.19       | -0.18          | -0.9    | -0.12          | -0.62   |
| Cropping Intensity              | <b>0.80*</b>       | 4.86        | <b>1.34**</b>  | 2.85    | 1.37           | 0.79    |
| Area Under Non-food Crops       | 0.01               | 0.04        | 0.02           | 0.06    | <b>-0.68**</b> | -2.04   |
| Irrigation intensity            | 0.01               | 0.17        | <b>0.72**</b>  | 1.7     | 0.34           | 0.66    |
| Consumption of fertilizers/hect | <b>0.53**</b>      | 2.73        | 0.24           | 1.34    | <b>0.67**</b>  | 4.57    |
| R <sup>2</sup>                  | <b>0.84</b>        |             | <b>0.91</b>    |         | <b>0.84</b>    |         |
| DW                              | <b>1.13</b>        |             | <b>1.02</b>    |         | <b>1.52</b>    |         |
| DW*                             | <b>1.85</b>        |             | 1.86           |         | <b>1.75</b>    |         |



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| Maharashtra                     |                |         |                |            |                |             |
|---------------------------------|----------------|---------|----------------|------------|----------------|-------------|
|                                 | Model 1        |         | Model 2        |            | Model 3        |             |
| Variables                       | $\beta$ -value | t-value | $\beta$ -value | t-value    | $\beta$ -value | t-value     |
| Constant                        | -5.95          | -1.29   | -9.34          | -1.41      | <b>1.67</b>    | <b>0.71</b> |
| Dummy                           | -0.24          | -1.42   | -0.12          | -0.51      | -0.14          | -0.56       |
| Cropping Intensity              | 1.5            | 1.4     | 2.77***        | 1.81       |                |             |
| Area Under Non-food Crops       | 0.89           | 1.59    | 1.03           | 1.34       | 1.41**         | 1.81        |
| Irrigation intensity            | 1.05**         | 4.63    |                |            |                |             |
| Consumption of fertilizers/hect | 0.33           | 1.43    | 0.2            | 0.66       | 0.43           | 1.43        |
| R <sup>2</sup>                  | <b>0.92</b>    |         | <b>0.85</b>    |            | <b>0.84</b>    |             |
| DW                              | <b>0.94</b>    |         | <b>0.98</b>    |            | <b>0.97</b>    |             |
| DW*                             | <b>1.84</b>    |         | <b>1.93</b>    |            | <b>2.06</b>    |             |
| Rajasthan                       |                |         | Andhra Pradesh |            |                |             |
|                                 | Model 1        |         | Model 2        |            | Model 3        |             |
| Variables                       | $\beta$ -value | t-value | $\beta$ -value | t-value    | $\beta$ -value | t-value     |
| Constant                        | -1.37          | -0.6    | -15.63         | -0.72      | 3.81*          | 5.14        |
| Dummy                           | -0.05          | -0.23   | -0.03          | -0.14      |                |             |
| Cropping Intensity              | 1.28**         | 2.65    | 4.26           | 0.9        |                |             |
| Area Under Non-food Crops       | 0.17           | 0.36    | <b>1.01***</b> | 1.71       |                |             |
| Irrigation intensity            | 0.71*          | 4.08    | 0.39           | 0.46       |                |             |
| Consumption of fertilizers/hect | 0.03           | 0.16    | -0.17          | -0.47      | <b>1.08*</b>   | 6.97        |
| R <sup>2</sup>                  | 0.83           |         | 0.9            |            | <b>0.8</b>     |             |
| DW                              | 0.56           |         | 0.56           |            | <b>0.54</b>    |             |
| DW*                             | 1.53           |         | 1.79           |            |                |             |
| Karnataka                       |                | Kerala  |                | Tamil Nadu |                |             |
|                                 | Model 1        |         | Model 1        |            | Model 1        |             |
| Variables                       | $\beta$ -value | t-value | $\beta$ -value | t-value    | $\beta$ -value | t-value     |
| Constant                        | -63.37*        | -4.87   | <b>-3.15</b>   | 1.29       | -0.02          | -0.11       |
| Dummy                           | -0.17          | -0.75   |                |            | -8.14*         | -3.85       |
| Cropping Intensity              | <b>15.82*</b>  | 4.97    | <b>0.98*</b>   | 4.14       | 0.83***        | 1.88        |
| Area Under Non-food Crops       | <b>-1.29**</b> | -2.61   |                |            | 1.46***        | 1.88        |
| Irrigation intensity            | 0.3            | 0.25    | 3.38*          | 3.47       | 0.64**         | 2.27        |
| Consumption of fertilizers/hect | 0.16           | 0.51    |                |            | 36.45*         | 3.32        |
| R <sup>2</sup>                  | 0.85           |         | 0.45           |            | 0.83           |             |
| DW                              | <b>1.59</b>    |         | 0.65           |            | 1.65           |             |
| DW*                             |                |         |                |            | <b>1.89</b>    |             |

Continued.....

| Variables                       | All India(P-W) |         |                |         |
|---------------------------------|----------------|---------|----------------|---------|
|                                 | Model 1        |         | Model 2        |         |
|                                 | $\beta$ -value | t-value | $\beta$ -value | t-value |
| Constant                        | -8.86          | -1.29   | -17.40**       | -2.67   |
| Dummy                           | <b>-0.19*</b>  | -1.74   | -0.14          | -1.22   |
| Cropping Intensity              | 1.9            | 1.57    | <b>3.43**</b>  | 3       |
| Area Under Non-food Crops       | 0.27           | 0.33    | 0.85           | 1       |
| Irrigation intensity            | <b>1.28***</b> | 1.95    | <b>1.81**</b>  | 2.64    |
| Consumption of fertilizers/hect | <b>0.68**</b>  | 2.35    |                |         |
| <b>R<sup>2</sup></b>            | <b>0.91</b>    |         | <b>0.92</b>    |         |
| <b>DW</b>                       | <b>0.77</b>    |         | <b>1.08</b>    |         |
| <b>DW*</b>                      | <b>1.85</b>    |         | <b>1.89</b>    |         |

Note: \* 1 % level of Significance; \*\* 5 % level of Significance; \*\*\* 10 % level of significance

DW= Original Durbin Watson Statistic.

DW\* = Transformed DW after applying Prais-Winsten( P-W) transformation

Dummy = Dummy variable for post reform period 1991, 1992.....2008

All series are converted into natural logarithm.

In Jammu and Kashmir, the situation is not much different. In model-1 the coefficient of cropping intensity and consumption of fertilizers are statistically significant at one percent level. If we increase one percent of cropping intensity, ceteris-paribus, agricultural credit will increase by 1.20 percent. The co-efficient of CF in model-1 is 1.28 which implies that one percent increase in consumption of fertilizer led to 1.28 percent increase in agricultural credit whereas irrigation intensity is not important determinant of agricultural credit in J&K. Even after applying Prais-Winsten transformation in model 2 of J & K, other variables area still insignificant.

In Punjab, the factors like irrigation intensity and consumption of fertilizers are statistically significant. It is already discussed that Punjab comes among the top five states in terms of credit per hectare. From the overall nature of the result, it can be said that there are some other factors which are influencing agricultural credit in Punjab. Model-1 of Uttar Pradesh represents that the co-efficient value of consumption of fertilizers per hectare (CF) is 0.79 which implies that one percent increase in CF increases about 0.79 percent increase in the agricultural credit in Uttar Pradesh. There is no other significant variable in U.P. After introducing one more

model excluding consumption of fertilizers, it is found that irrigation intensity has also become significant. The model explains about 90 percent variation in agricultural credit.

In sum, result shows that the cropping intensity is statistically significant in all the states viz. Haryana, Himachal Pradesh, Jammu & Kashmir, Assam, Bihar, Orissa, West Bengal, Gujarat, Maharashtra, Rajasthan, Karnataka, Kerala and Tamil Nadu. In other words, the cropping intensity is positively affecting agricultural credit. Whereas an area under non-food crops is statistically significant in Haryana, Orissa, Assam, Madhya Pradesh, Andhra Pradesh, Maharashtra, Gujarat, Karnataka and Tamil Nadu but it is negatively affecting agricultural credit in Karnataka and Madhya Pradesh. It does not influence agricultural credit in other states including Bihar and West Bengal. The irrigation intensity which is the percentage of gross irrigated area to the gross cropped area is statically significant in Haryana, U.P, Punjab, Bihar, Maharashtra, Orissa, Rajasthan Kerala and Tamil Nadu. In the former states the irrigation intensity is positively affecting agricultural credit. The agricultural credit is not significantly affected in other states comprising Assam, West Bengal, Gujarat, Madhya Pradesh and Karnataka. However, the consumption of fertilizers which is also expected as one of the most important factor influencing agricultural credit has found significant in Haryana, Jammu and Kashmir, Punjab, U.P, Assam, Bihar, Orissa, West Bengal, Gujarat, Madhya Pradesh, Kerala and Tamil Nadu. In other words, any increment in consumption of fertilizers in these states will also increase the demand for agricultural credit. But the elasticity (or slope coefficient) of credit to the consumption of fertilizers per hectare is different across the states. Due to presence of high multicollinearity among explanatory variables in Andhra Pradesh and Kerala, step-wise regression has been done. It is obvious that there is only one factor (consumption of fertilizers) which influences agricultural credit in Andhra Pradesh. In Punjab, consumption of fertilizers as well as irrigation intensity are positively affecting agricultural credit. On the other hand, the dummy variable which is used to see the impact of economic reforms on the agricultural credit shows that there had been no significant impact of economic reforms in the states, except Haryana and Tamil Nadu where it is significant but has a negative effect on the agricultural credit.

### 4.3: Panel Regression Analysis across the States

Panel regression has been undertaken to assess the impact of explanatory variables in totality. Another reason for using the panel regression method has been to get greater flexibility in modelling differences in behaviour across individual states. The individual effect is assumed to be constant over time and specific to the individual states. Hence, differences across the states can be captured in differences in the constant term<sup>3</sup>.

$$\ln Y_{it} = \beta_0 + \beta_1 \ln X_{it} + u_{it} \dots \dots \dots$$

Where i stand for the *i*th cross sectional unit which is 17 major states and t denote *t*th time period. There are k regressors in  $X_{it}$  excluding the constant term. The individual effect,  $\beta_0$  is taken to be constant over time t and specific to the individual cross sectional units i. As it stands, this model is a classical regression model. If we take intercept constant across the states, then the OLS provides consistent and efficient estimators. Two basic frameworks have been used to generalize this model. The Fixed Effect approach and Random Effect takes  $\beta_0$ , to be a group specific constant and group-specific disturbance term in the regression model, respectively

$$\ln PHC = \beta_0 + \beta_1 \ln(CI)_{it} + \beta_2 \ln(ANFC)_{it} + \beta_3 \ln(II)_{it} + \beta_4 \ln(FC)_{it} + u_{it} \dots (4.1)$$

Table 4.3 presents the coefficient obtained from panel regression. Based on the least square residuals, Lagrange Multiplier (LM) Test statistic has been worked out. The value of LM test is 1571.72 which far exceed the 95 percent critical value for chi-square with one degree of freedom (3.84). At this point, we conclude that the classical regression model with single constant term is inappropriate for these data. Furthermore, the result of the LM test is to reject the null hypothesis in favour of the Random Effect Model. But it is best to reserve judgement on that because there is another competing specification that might

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<sup>3</sup> It is also possible to allow the slopes to vary across the states. But it requires great complexity in calculation.

induce these same results, the Fixed Effect model. Hausman Test is also used to make proper judgment about the two approaches. The test statics is 20.02 which is greater than the table value (9.48). The hypothesis that the individual effects are uncorrelated with the other regressors in the model can be rejected. Hence, we would conclude that of the two alternatives we have considered the Fixed Effect Model as the better choice for the interpretation, which is shown in the Table 4.3.

Results show that in the fixed effect model, the explanatory variables such as cropping intensity, area under non-food crops, area under irrigation as a percentage of gross cropped area and consumption of fertilizer per hectare have got positive signs as expected. The positive and significant coefficient of cropping intensity implies that 1 per cent increase in the percentage of net sown area to the gross cropped area will also lead to 1.05 per cent increase in the credit per hectare of net sown area. This suggests that in any state, increase in the cropping activities leads to a greater flow of agricultural credit. On the other hand, the positive and statistically significant coefficient of irrigation intensity indicates that 1 per cent increase in the irrigated area as a percentage of gross cropped area will also lead to 0.13 per cent increase in the credit obtained per hectare of net sown area. This suggests that, in any state, larger percentage of gross area irrigated to gross cropped area leads to a greater flow of agricultural credit by formal financial institutions. As we know that irrigation facility reduces uncertainty of crops, thereby attracting the banks to lend more in those areas.

| <b>Table: 4.3 Description, Expected Sign, and Coefficient of Variables in the Log-Linear Model(Dependent Variable = Credit per hectare(NSA))</b> |                      |                           |                |                            |                |
|--|----------------------|---------------------------|----------------|----------------------------|----------------|
| <b>Variables</b>   | <b>Expected Sign</b> | <b>Fixed Effect Model</b> |                | <b>Random Effect Model</b> |                |
|  |                      | <b>β-value</b>            | <b>t-value</b> | <b>β-value</b>             | <b>t-value</b> |
| <b>Constant</b>  |                      | -                         | -              | -0.57                      | -0.89          |
| Cropping Intensity   | +                    | <b>1.05*</b>              | 7.87           | 1.00*                      | 7.9            |
| Area Under Non-food Crops  | +                    | <b>0.29*</b>              | 1.1            | <b>0.16**</b>              | 2.39           |
| Irrigation intensity   | +                    | <b>0.13**</b>             | 4.74           | <b>0.25*</b>               | 3.67           |
| Consumption of fertilizers/hectare   | +                    | <b>0.62*</b>              | 16.62          | <b>0.68*</b>               | 16.36          |
| <b>Lagrange Multiplier Test = 1571.72</b>  |                      |                           |                |                            |                |
| <b>Fixed vs. Random Effects(Hausman) = 20.02</b>   |                      |                           |                |                            |                |
| No of Observations = 476   |                      |                           |                |                            |                |

\*\*\* p<0.05; \*\* p<0.01; \* p<0.001

The coefficient for the area under non-food crops (ANFC) is positive and significant which means 1 per cent increase in the ANFC leads to 0.29 per cent increase in the credit per hectare of net sown area. The elasticity of credit for consumption of fertilizers per hectare (GCA) is 0.62 which means one percent increase in consumption of fertilizers led to 0.62 percent increase in agricultural credit. On the whole, the farmers in the irrigated area or/and with high consumption of fertilizers are most likely to benefit from institutional lending agencies. The cropping intensity and area under non-food crops are also important determinant of agricultural credit. Table 4.4 presents the intercepts of fixed effect model for 17 major states. This difference in intercepts can be attributed to the unique features of each state. There may be some specific characteristics associated with each state.

| State            | Coefficient    | t-value |
|------------------|----------------|---------|
| Haryana          | -0.76          | -1.11   |
| Himachal Pradesh | <b>0.89*</b>   | 6.2     |
| Jammu & Kashmir  | -0.08          | -0.74   |
| Punjab           | <b>-0.22**</b> | -2.07   |
| Uttar Pradesh    | <b>-0.35*</b>  | -3.22   |
| Assam            | 0.16           | 1.07    |
| Bihar            | -0.01          | -0.11   |
| Orissa           | <b>0.28**</b>  | 2.33    |
| West Bengal      | <b>-0.25**</b> | -2.12   |
| Gujarat          | -0.2           | -1.53   |
| Madhya Pradesh   | -0.09          | -0.72   |
| Maharashtra      | <b>0.09**</b>  | 0.68    |
| Rajasthan        | -0.1           | -0.81   |
| Andhra Pradesh   | 0.16           | 1.39    |
| Karnataka        | 0.21           | 1.63    |
| Kerala           | <b>1.47*</b>   | 9.71    |
| Tamil Nadu       | <b>0.67*</b>   | 5.96    |

#### **4.4: Impact of Agricultural Credit on Agricultural Income**

Credit is the back bone for any business and more so for agriculture which has traditionally been a nonmonetary activity for the rural population in India. Agricultural credit is an integral part of the process of modernisation of agriculture and commercialisation of the rural economy. The introduction of easy and cheap credit is the quickest way for boosting agricultural production. Therefore, it was the prime policy of all the successive governments to meet the credit requirements of the farming community of India. Agriculture as a sector depends more on credit than any other sector of the economy because of the seasonal nature of the production and a changing trend from subsistence to commercial farming.

The incremental credit deposit (CD) ratio which averaged 60.4 per cent during 1981-91 drastically reduced to 34.5 per cent during 1991-2001. The effects are further reflected in the decreasing trend in the capital formation in Indian agriculture, since early 1990s. The level of capital investments in agriculture that was 1.88 per cent of GDP in 1992-93, declined to 1.27 per cent in 2002-03. As a result, the growth rates in agriculture which averaged 3.2 per cent per annum for the pre-reform period of 1982-90 declined to 3.2 per cent in the post-reform period of 1992-2000. In the next period, it has further decelerated to 0.3 per cent, (-) 0.4 per cent, (-) 6.9 per cent and 0.7 per cent for the years 1999-2000, 2000-01, 2002-03 and 2004-05, respectively (GoI, 2006). Thus the vicious circle generated by the inadequate availability of agricultural credit brought about low agricultural growth rate in India.

Table 4.5 shows that agricultural credit is significantly correlated with agriculture SDP per hectare in all the states, exception being Orissa and Kerala. The association of agricultural GDP with agricultural credit was found to be very high and significant. At the all India level, the correlation coefficient between agricultural credit and GDP was as high at 0.87, indicating the role of credit in promoting agricultural growth in India.

| <b>Table: 4.5: Correlation Matrix of Agricultural SDP and Agricultural Credit per hectare: 1981-81 to 2007-08</b> |         |
|---|---------|
| State   |         |
| Haryana   | 0.917** |
| Himachal Pradesh  | 0.882** |
| Jammu & Kashmir   | NA      |
| Punjab  | 0.833** |
| Uttar Pradesh   | 0.843** |
| Assam   | 0.485** |
| Bihar   | 0.920** |
| Orissa  | 0.273   |
| West Bengal   | 0.748** |
| Gujarat   | 0.751** |
| Madhya Pradesh  | 0.773** |
| Maharashtra   | 0.662** |
| Rajasthan   | 0.767** |
| Andhra Pradesh  | 0.931** |
| Karnataka   | 0.641** |
| Kerala  | 0.296   |
| Tamil Nadu  | 0.788** |
| All India   | 0.879** |

\*\* Correlation is significant at the 0.01 level (2-tailed).

Source: Central Statistical Organisation (CSO), National Accounts Statistics, : Statistical Statement Relating to Cooperative Movement, NABARD

In order to examine the impact of agricultural credit on GDP agriculture, a regression is estimated at all India level in the double log form. The analysis is not undertaken at state level due to non-availability of data on investments (public and private) in each state. The gross fixed capital formation (GFCF) in agriculture sector has been taken and represents the public and private investment in agriculture. Besides agricultural credit and gross fixed capital formation, the gross cropped area has also taken as an important factor affecting agriculture GDP. The model takes the following form:

$$\ln AG\_GDP = \beta_0 + \beta_1 \ln Agr\_Credit + \beta_2 \ln GCA + \beta_3 \ln GFCF + \beta_4 \ln ITT + ut \dots (4.5)$$

$\ln AG\_GDP$  = Natural logarithm Agricultural GDP at 1999-2000 prices.

$\ln Ag\_Credit$  = Natural logarithm of total agriculture credit (in thousands Rs) supplied by SCBs (including RRBs) and Cooperatives (in Rs) at 1999-2000 prices.

$\ln GCA$  = natural logarithm of gross cropped area (in thousand hectare)



$\ln GFCF$  = natural logarithm of gross fixed capital formation (in thousands Rs) in agriculture at 1999-2000 prices.

$\ln ITT$  = natural logarithm index of terms of trade<sup>4</sup> between agriculture and non-agricultural sectors at 1999-2000 prices.

$\beta_1, \beta_2, \beta_3, \beta_4$  are their respective slope coefficient,  $\beta_0$  is intercept and  $u_t$  is the error term.

The model shows the technical relationship between agricultural GDP and its determinants. It includes agriculture GDP as dependent variable and the explanatory variables are agriculture credit (PHC), gross cropped area (GCA), gross fixed capital formation (GFCF) in agriculture and index of terms of trade. Terms of trade is taken to represent prices. The OLS method in a log linear form has been applied to examine the impact of the above on the agricultural GDP. Table 4.4 shows that all the variables are highly significant at one percent level. The positive and statistically significant value of agricultural credit demonstrates that it is positively associated with agricultural GDP. An increase in the supply of agricultural credit by one percent increases agricultural GDP by 0.18 percent. Coefficient of gross cropped area (GCA) is positive and significant at one percent level, which implies that increase in the coverage of cultivation in agriculture steps up the agricultural GDP. In other words, an increase in gross cropped area by one percent brings about 2.44 percent increase in the agricultural GDP.

|                               | <b><math>\beta</math>-value</b> | <b>t-value</b> |
|-------------------------------|---------------------------------|----------------|
| <b>Constant</b>               | -15.66*                         | -4.6           |
| Agricultural Credit           | <b>0.18*</b>                    | 8.3            |
| Gross Cropped Area            | <b>2.44*</b>                    | 7.17           |
| Gross Fixed Capital Formation | <b>0.06*</b>                    | 5.48           |
| Index of Terms of Trade       | <b>0.99*</b>                    | 4.82           |
| AD R2                         | 0.98                            |                |
| DW                            | 1.93                            |                |

Note: \* 1 % level of Significance.

<sup>4</sup> Index of terms of trade is taken at lag one because it is assumed that the GDP in agriculture in the current year depends on previous years terms of trade.

The gross fixed capital formation (GFCF) has also a significant impact on agricultural GDP. But the elasticity (or coefficient) of GDP in agriculture to the GFCF is 0.06 which shows that an increase in GFCF by one percent increases the agricultural GDP by 0.06 percent. The adjusted  $R^2$  ( $R^2$ ) which is corrected over the degree of freedom shows that model-explains about 98 percent variations in the agricultural GDP. In other words, the explanatory variables included in the model are able to explain about 98 percent variations in the dependent variable (AG\_GDP). The coefficient of index of terms of trade between agricultural and non-agricultural sectors is 0.99 which implies that one percent increase in terms of trade index in the previous year leads to 0.99 percent increase in the agricultural GDP. If terms of trade is favourable to agricultural sector, income will certainly increase.

## Chapter 5

### Summary and Conclusion

#### 5.1: Importance of Agricultural Credit

A developed and modernized agriculture is fully commercialized and operates for profit motive with the use of new inputs and technologies. The traditional agriculture is basically a technologically motionless phase in which attempted changes usually produced small increase in the production. In the absence of new techniques, any injection of credit will be used primarily to finance non-productive expenditure. Thus, what is required is not state sponsored expansion of rural credit, but a land augmenting technological progress associated with fertilizer-fed hybrid seeds and controlled irrigation facilities to increase productivity per unit of area. Once new technology has been introduced and new inputs are made available in the market, credit will play a significant role in increasing agriculture productivity. For the successful implementation of any agricultural credit projects, certain conditions must be fulfilled such as provisions of remunerative prices, proper marketing facilities, creation of infrastructure, availability of new inputs, proper economic planning and extensive services, and proper system of land tenure. Clearly, availability of credit is a pre-requisite for the use of new inputs and technologies in agriculture. Credit always helps the farmer to adopt new technologies, encourage investment in machinery and irrigation and supplement the use of quality inputs to increase agricultural production.

In India, the share of institutional sources in total loan outstanding has increased up to 1980s. But in the reform period the share of institutional sources is found to have declined. It is, therefore, important to study changes in the relative contribution of institutional and non-institutional sources of loan outstanding at the disaggregate state level. The highly skewed distribution of institutional credit in favour of relative progressive regions is likely to generate strong backwash effects, thereby retarding the overall pace of agriculture development. It is important to look into a more egalitarian credit plan to maintain the rapid and balanced agriculture development in the country. With the passage of time, Indian agriculture has also been commercialised and the farmer has to purchase costly inputs like fertilizers, tractors, pump sets from the market to produce more. The agricultural credit as a means to buy these modern

inputs, indirectly affects the production process. With this background, this research is taken up with the following objectives.

### **5.2: Objectives of the Study:**

- To study the relative role of institutional and non-institutional sources of credit across the states and analyse changes there in during 1981, 1992 and 2002.
- To examine the extent of regional variations and growth in farm credit by Commercial Banks (CBs), Regional Rural Banks (RRBs) and Cooperatives from 1981 to 2008, broadly representing the pre and post reform periods
- To identify the determinants of agricultural credit given by institutional sources in each state from 1981 to 2008
- To see the impact of farm credit on gross domestic product (GDP) in agriculture

### **5.3: Hypotheses:**

H1: Credit from institutional sources to agriculture has improved across the states.

H2: Regional disparities in the distribution of credit by Commercial Banks (CBs), Regional Rural Banks (RRBs) and Cooperatives have increased from 1981 to 2008.

H3: Agricultural credit is positively influenced by the use of farm inputs.

H4: Agricultural credit has a positive impact on GDP in agriculture and allied activities

### **5.4: Data Base and Methodology**

The analysis in the study is undertaken for seventeen major states viz. Andhra Pradesh, Assam, Bihar (undivided), Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh (undivided), Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh (undivided), West Bengal, Jammu & Kashmir and Himachal Pradesh. These states account for more than 95 per cent of the population, 93 per cent of the Net Domestic Product (NDP), contributed, on an average, 90 per cent of the total deposits in the country through Scheduled Commercial Banks (SCBs) including RRBs for the

last twenty years and 96 per cent of the total credit goes to these states. In order to study the relative role the institutional and non-institutional sources of credit, state-wise and source-wise data on loan outstanding has been collected from the Reports on 37<sup>th</sup>, 48<sup>th</sup> and 59<sup>th</sup> Rounds of the National Sample Survey (NSS) pertaining to the years of 1981, 1991 and 2002. To examine the extent of inequality (measured by coefficient of variation) in the supply of credit, availability of credit per hectare (Net Sown Area) has been taken as an indicator of supply of credit. Log linear regression analysis has been used to see the effect of explanatory variables (consumption of fertilizer per hectare, cropping intensity, irrigation intensity and percentage of area under non-food grains) on agricultural credit per hectare. Since the analysis is across the states for a longer time period, along with simple multiple regression, a panel regression analysis (fixed effect and random effect techniques) has also been used, mainly to enrich the analysis. In this model, the individual effect is assumed to be constant over time and specific to the individual states. In order to see the association of agricultural credit with agricultural gross state domestic product (GSDP), the analysis is done at all India level. Other macro variables like gross cropped area (GCA), gross fixed capital formation in agriculture (GFCF) and index of terms of trade between agricultural and non-agricultural sectors are used as explanatory variables. Due to non-availability of data on public and private investment at the state-level, the analysis is done only at the national level.

### **5.5: Major Findings Obtained from the Analysis**

The analyses of the relative role of institutional and non-institutional sources of loans for the three different time periods 1981, 1991 and 2002 brought out the following. The dependency of rural households on non-institutional sources of credit, which was continuously declined up to 1980s increased in all the states in the reform period, except in Himachal Pradesh where it witnessed a marginal decline. At the national level, institutional sources accounted for about 61% of the total loans outstanding in 1981 which increased to 66 percent in 1991 and further marginally declined to 57.7 percent in 2002. This shows that the share of institutional credit agencies in total outstanding loans of the rural households has declined about 7 percentage points between 1991 and 2002. The money lenders and traders are the main supplier of non-institutional sources of outstanding loans. The share of money lenders, which declined continuously in the first three decades after independence, was 16.1 percent in 1981.

In the latter period, its share increased to 17.5 percent in 1991 and 25.7 percent in 2002. It is disturbing to note that in many regions including Andhra Pradesh, Karnataka, Maharashtra, Rajasthan, Haryana and Himachal Pradesh, the farmers continue to borrow mainly from non-institutional sources. In the period 1991 to 2002, the share of money lenders increased in all states exception being Jammu and Kashmir and Uttar Pradesh (UP) where it declined from 2.2 to 1.1 percent and 15.7 to 12.5 percent, respectively. But in Jammu and Kashmir informal lenders developed in the form of traders whose share increased from 2.2 percent in 1991 to 15.2 percent in 2002. Uttar Pradesh is the only state where the share of money lenders declined from 1981 onwards.

An increase in indebtedness of rural households to non-institutional sources was on account of consumption and similar other expenditures, which could not easily be financed from the institutional sources. It is argued that it was the weakening of the institutional architecture for rural credit, and the appearance of non-incentive credit flow to agriculture through the mechanical application of Basel norms and the squeeze on resources available for agricultural credit operations (Satish 2007), which led to the slow growth of institutional sources of credit. Most probably, the non-institutional sources of credit emerged on the ground of decaying institutional architecture of credit created in the post-reform period.

An analysis of the regional variations in the distribution of credit flow to agriculture supplied by CBs, RRBs and Cooperatives reveals that the percentage share of agricultural credit going to various states bears a high level of unevenness. A comparison has been made between six developed states which include Punjab, Haryana and the southern region (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu) and six less developed states which include Assam, Bihar, Orissa, West Bengal, MP and Rajasthan. The analysis shows that the former six states which possess about 25 percent of the NSA received 54.24 percent of agricultural credit from SCBs (including RRBs) and Cooperatives in 1980-81, 51.27 percent in 1990-91, 54.9 percent in 2000-01 and 50.47 percent in 2008. While the latter six, accounted for about 40 percent of NSA and could avail only 20.51 percent, 21.19 percent, 18.08 percent, and 20.62 percent of total agricultural credit in the same periods.

The trends in the supply of agricultural credit by SCBs, RRBs and cooperatives at the state and all India level, reveal that the growth rate of agricultural credit rapidly declined during the reform period. The growth rates of agricultural credit were uneven across the sub-periods (pre- and reform years) as well as across the bank groups. The supply of credit to this sector in real terms grew at a much faster rate during the pre-reform period as compared to the post-reform period. In the period 2001-2008, there was high growth rate at all India level. Across the bank groups also, a similar pattern could be observed. The regional variations across the states were higher for PHC of cooperatives than that of CBs and RRBs. The coefficient of variation (CV) of PHC in the case of cooperatives was 0.89 in 1981, 1.38 in 1991, 1.37 in 2001 and 1.52 in 2008. It declined to 0.70 in 2001 from 0.77 in 1981 and has increased to 1.21 percent during the revival period. The distribution policy of the RRBs was more or less fair compare to CBs and cooperatives. The inequality in the distribution of credit (measured by CV) which was 0.99 percent in 1981 declined to 0.65 percent in 2008 for the RRBs. It is found that the regional inequality measured by the coefficient of variation was more or less constant and lower after the reform period. But in the case of Cooperatives and CBs it has drastically increased in the revival period.

The key finding is that the poor states in terms of annual growth rate of agricultural credit performed better in comparison to the developed states in the pre-reform period. But the trend reversed in the first decade of reform period (1991-2001). The pace of deterioration in the growth of credit per hectare was more in the less developed states viz. Bihar (-3.28 percent), Maharashtra (1.03 percent), M.P (0.89 percent) and Rajasthan (0.44 percent). The low level of growth rate was mainly the reversal of the public policy (extending the reach of agricultural credit, providing affordable and timely credit to rural households (specifically the economically vulnerable households) and overcoming historical problems of imperfect and fragmented rural credit markets) in the reform period. In the next period (2001- 08) which is called the period of revival of agricultural credit, the growth was more than 20 percent in all the states, except Punjab, M.P, Rajasthan, Assam and Tamil Nadu.

The ranking of the states on the basis of credit per hectare shows that Punjab, Haryana, Kerala and Tamil Nadu had dominated in the credit per hectare supplied by CBs and cooperatives, while, Assam, MP and Orissa were among the bottom of the ranking in all the periods. One of the most interesting features about Orissa and Bihar

which were among the bottom five in case of CBs come to the top five in PHC of RRBs. On the other hand, the well-developed states like Punjab, Gujarat and Tamil Nadu which were among top five of CBs, have received very less amount of agricultural credit supplied by RRBs. Even after revival of agricultural credit, it is really a worrying situation given the fact that some of the main centres of agriculture growth such as West Bengal, U.P have witnessed lower growth rates in loan outstanding by cooperatives.

On the factors that determine the flow of credit to agriculture, state wise results based on regression analysis show that credit flow to agriculture is positively influenced by cropping intensity, area under non-food crops, irrigation intensity and consumption of fertilizer per hectare in most of the states. The analysis shows that an increase in the cropping intensity increases the demand for credit in Haryana, Himachal Pradesh, Jammu & Kashmir, Assam, Bihar, Orissa, West Bengal, Gujarat, Maharashtra, Rajasthan, Karnataka, Kerala and Tamil Nadu. The area under non-food crops has significant and positive impact on the agricultural credit in Haryana, Orissa, Assam, Madhya Pradesh, Andhra Pradesh, Maharashtra, Gujarat, Karnataka and Tamil Nadu but has a negative effect in Karnataka and Madhya Pradesh.. In other words, increase in the area under non-food crops may not increase the demand for agricultural credit in the latter states. The analysis also shows that the irrigation intensity which is the percentage of gross irrigated area to the gross cropped area has a significant impact on agriculture credit in Haryana, U.P, Punjab, Bihar, Maharashtra, Orissa, Rajasthan Kerala and Tamil Nadu. In the former states, the irrigation intensity is positively affecting agricultural credit. The agricultural credit is not significantly affected in other states viz. Assam, West Bengal, Gujarat, Madhya Pradesh and Karnataka. Fertilizer consumption per hectare is also found to be an important determinant of agriculture credit in Haryana, Jammu and Kashmir, Punjab, U.P, Assam, Bihar, Orissa, West Bengal, Gujarat, Madhya Pradesh, Kerala and Tamil Nadu. In other words, any increase in consumption of fertilizers in these states will also increase the demand for agricultural credit. The dummy variable which is used to examine the impact of economic reforms on the agricultural credit shows a negligible impact of economic reforms on agricultural credit in all the states, except Haryana and Tamil Nadu where it has a significant but negative effect.



Since different states have different characteristics, the panel regression method has been used to evaluate the impact of explanatory variables on the dependent variable. Another reason for using the panel regression method has been to get greater flexibility in modelling differences in behaviour across individual states. It give more information, less collinearity among the explanatory variables, more degrees of freedom and more efficiency in the estimates. Based on the Langrange Multiplier statistics and Hausman specification test, the Fixed Effect Model was preferred over Random Effect Model in the state level analysis. The percentage of net sown area to the gross cropped area and consumption of fertilizer per hectare (GCA) were found to be the most significant explanatory variables for the variations in the credit flow per hectare of net sown area in 17 major states. Area under non-food crops and area under irrigation as a percentage of gross cropped area have also found to be significant. But the elasticity of credit for cropping intensity and consumption of fertilizers per hectare are higher compared to other explanatory variables. On the whole, the states having high cropping intensity area or/and with high consumption of fertilizers are most likely to benefit from institutional lending. The percentage of area under irrigation and area under non-food crops are also important determinants of agricultural credit in all the states. Since assured irrigation reduced crop uncertainty, bankers are probably giving priority to lend more to states with better irrigation facilities.

Finally, the analysis on the impact of agricultural credit on agricultural income shows a positive impact. Other variables viz. Capital formation, gross cropped area and lagged index of terms of trade between agricultural and non-agricultural sectors are also significantly explaining variations in agricultural income.

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## Appendix:

| <b>Appendix Table 3.1: Percentage share of Major Non-Institutional agencies in total outstanding Cash Loans of Rural Households in 17 major states</b> |                      |             |             |                |              |             |                              |             |
|--|----------------------|-------------|-------------|----------------|--------------|-------------|------------------------------|-------------|
|  | <b>Money lenders</b> |             |             | <b>Traders</b> |              |             | <b>Relatives and friends</b> |             |
| <b>States</b>  | <b>1981</b>          | <b>1991</b> | <b>2002</b> | <b>1981</b>    | <b>1991</b>  | <b>2002</b> | <b>1991</b>                  | <b>2002</b> |
| Haryana  | 14.1                 | 12.6        | 24.1        | 0.6            | 3            | 3.1         | 2.1                          | 3.4         |
| HP   | 8.4                  | 4.1         | 7.2         | 1.3            | 1            | 5.5         | 30.7                         | 17.0        |
| J&K  | 1.8                  | 2.2         | 1.1         | 27.4           | 2.2          | 15.5        | 17.0                         | 15.5        |
| Punjab   | 9.1                  | 3.6         | 36.3        | 5.0            | 2.6          | 8.2         | 7.9                          | 6.3         |
| UP   | 26.5                 | 15.7        | 12.5        | 2.6            | 1.8          | 2.3         | 9.2                          | 14.4        |
| <b>NW Region</b>   | <b>12.0</b>          | <b>7.6</b>  | <b>16.2</b> | <b>7.4</b>     | <b>2.12</b>  | <b>6.9</b>  | <b>13.4</b>                  | <b>11.3</b> |
| Assam  | 4.9                  | <b>4.0</b>  | 15.5        | 1.5            | <b>2.6</b>   | 12.0        | 17.7                         | 24.7        |
| Bihar  | 23.9                 | 16.3        | 25.9        | 1.3            | 1.5          | 1.4         | 5.4                          | 13.2        |
| Orissa   | 7.0                  | 12.6        | 14.8        | 3.5            | 0            | 0.8         | 3.6                          | 8.4         |
| WB   | 9.8                  | 5.9         | 13.0        | 5.3            | 1.4          | 10.7        | 8.7                          | 15.4        |
| <b>East Region</b>   | <b>11.4</b>          | <b>9.7</b>  | <b>17.3</b> | <b>2.9</b>     | <b>1.375</b> | <b>6.2</b>  | <b>8.9</b>                   | <b>15.4</b> |
| Gujarat  | 2.7                  | <b>3.3</b>  | 6.5         | 6.6            | <b>0.7</b>   | 4.4         | 14.9                         | 17.7        |
| MP   | 21.6                 | 22.1        | 17.8        | 4.5            | 0.8          | 6.6         | 0.8                          | 8.2         |
| Maharashtra  | 2.6                  | 6.8         | 6.8         | 0.8            | 0.4          | 0.8         | 9.5                          | 5.9         |
| Rajasthan  | 25.9                 | 37.3        | 36.5        | 4.3            | 11           | 19.2        | 0.5                          | 6.9         |
| <b>Central Region</b>  | <b>13.2</b>          | <b>17.4</b> | <b>16.9</b> | <b>4.1</b>     | <b>3.225</b> | <b>7.8</b>  | <b>6.4</b>                   | <b>9.7</b>  |
| AP   | 24.2                 | <b>36.0</b> | 53.4        | 4.8            | <b>3.1</b>   | 4.8         | 1.3                          | 5.3         |
| Karnataka  | 9.4                  | 10.1        | 20.0        | 0.9            | 0.8          | 1.9         | 2.7                          | 6.8         |
| Kerala   | 3.6                  | 2.7         | 7.4         | 1.4            | 0.6          | 1.7         | 4.0                          | 6.6         |
| Tamil Nadu   | 28.0                 | 22.1        | 39.7        | 4.3            | 2            | 0.4         | 6.3                          | 5.2         |
| <b>Southern Region</b>   | <b>16.3</b>          | <b>17.7</b> | <b>30.1</b> | <b>2.9</b>     | <b>1.625</b> | <b>2.2</b>  | <b>3.6</b>                   | <b>6.0</b>  |
| <b>ALL INDIA</b>   | <b>16.8</b>          | <b>17.6</b> | <b>25.7</b> | <b>3.4</b>     | <b>2.5</b>   | <b>5.2</b>  | <b>5.5</b>                   | <b>8.5</b>  |

Source: National Sample Survey 37<sup>th</sup>, 48<sup>th</sup>, and 59<sup>th</sup> Round. Money lenders include both professional and agriculturist money lenders.

**Appendix Table 3.2: Percentage share of Major Institutional Agencies in outstanding cash loans of Rural Households in 17 major states**

| States                 | Banks       |             |             | Cooperatives |             |             |
|------------------------|-------------|-------------|-------------|--------------|-------------|-------------|
|                        | 1981        | 1991        | 2002        | 1981         | 1991        | 2002        |
| Haryana                | 46.6        | 43.5        | 42.6        | 22.6         | 23.0        | 23.9        |
| HP                     | 25.9        | 32.9        | 47.6        | 41.7         | 21.7        | 11.6        |
| J&K                    | 31.1        | 43.0        | 54.3        | 7.4          | 9.1         | 0.2         |
| Punjab                 | 43.8        | 55.3        | 28.4        | 21.4         | 20.1        | 17.6        |
| UP                     | 29.0        | 44.8        | 45.5        | 21.1         | 14.2        | 5.8         |
| <b>NW Region</b>       | <b>35.3</b> | <b>43.9</b> | <b>43.7</b> | <b>22.8</b>  | <b>17.6</b> | <b>11.8</b> |
| Assam                  | 16.8        | 34.5        | 27.8        | 6.9          | 8.3         | 2.7         |
| Bihar                  | 29.6        | 36.9        | 46.4        | 8.2          | 20.1        | 3.5         |
| Orissa                 | 27.4        | 44.2        | 43.7        | 46.7         | 21.5        | 18.1        |
| WB                     | 32.4        | 41.5        | 28.5        | 24.0         | 20.1        | 19.2        |
| <b>East Region</b>     | <b>26.6</b> | <b>39.3</b> | <b>36.6</b> | <b>21.5</b>  | <b>17.5</b> | <b>10.9</b> |
| Gujarat                | 14.3        | 29.2        | 27.2        | 53.8         | 39.7        | 41.8        |
| MP                     | 31.5        | 44.5        | 44.3        | 32.6         | 21.2        | 18.8        |
| Maharashtra            | 26.7        | 27.2        | 34.1        | 54.8         | 45.4        | 48.5        |
| Rajasthan              | 23.6        | 25.4        | 27.0        | 16.4         | 6.6         | 5.9         |
| <b>Central Region</b>  | <b>24.0</b> | <b>31.6</b> | <b>33.2</b> | <b>39.4</b>  | <b>28.2</b> | <b>28.7</b> |
| AP                     | 18.3        | 15.4        | 20.0        | 20.2         | 12.4        | 10.4        |
| Karnataka              | 48.9        | 42.7        | 50.1        | 26.5         | 22.1        | 16.9        |
| Kerala                 | 37.1        | 19.1        | 49.1        | 34.0         | 45.6        | 28.3        |
| Tamil Nadu             | 12.8        | 32.5        | 28.1        | 27.8         | 17.5        | 23.3        |
| <b>Southern Region</b> | <b>29.3</b> | <b>27.4</b> | <b>36.8</b> | <b>27.1</b>  | <b>24.4</b> | <b>19.7</b> |
| <b>ALL INDIA</b>       | <b>28.0</b> | <b>33.7</b> | <b>35.6</b> | <b>28.7</b>  | <b>21.6</b> | <b>19.6</b> |

Source: National Sample Survey 37<sup>th</sup>, 48<sup>th</sup>, and 59<sup>th</sup> Round. Money lenders include both professional and agriculturist money lenders.

