Credit Risk in Agricultural Sector

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<<*Abstract*

The objective of the research paper is to study the credit deficit in agricultural sector. Credit deficit in agricultural sector means the difference between the institutional farm credit availed by the farmers and cost of production. Farmers require access to affordable, adequate and timely credit to purchase and use the inputs required for cultivation. But the credit provided by the financial institutions to agricultural sector continues to be inadequate and less than the cost of production. It compels them to depend on informal sources of credit. So, in this paper in order to examine the difference between institutional short term credit availed by the farmers and cost of production i.e. credit deficit per acre and per farms, a field study (2009-10) of three villages of different degree of Bargarh district (Orissa) India has been done. In order to test the hypotheses to know the significant difference in the credit deficit per acre and per farm across the villages and farm sizes TWO WAY ANOVA TEST has been done.
Keywords: *Cost,Credit,Deficit,Farms,Production,Villages.*

1. INTRODUCTION

Credit is assumed as an important ingredient in the agricultural production. Its prominent role strengthens the farmers and helps to enhance the agricultural production and productivity. The high yielding variety seeds combined with purchased inputs like fertilizers and plant protection chemicals in requisite proportion result in higher productivity. The application of new technological inputs obtained through credit helps to boost agricultural production and productivity. But the deficit in the short-term institutional credit has stood in the way of expected achievement as because the farmers are unable to utilise such facilities under the financial constraints.

As per the report of NABARD (2009-10), the total flow of short term credit that is crop loan has already been increased form Rs. 10,53,50 crores in 2005-06 to Rs. 21,04,61 in 2008-09. Besides, for the year 2011-12, the Govt. has raised the target of credit flow to the farmers form Rs. 375000 crores in 2010-11 to Rs. 475000 crores in 2011-12.It is note worthy that the flow of agricultural credit and rural credit witnessed rapid increase after the first round of bank nationalization in 1969.Between 1971-72 and 2007-08 agricultural credit witnessed a jump of around 220 times. But the overall higher order credit growth in banking system has not supported the desired expansion of credit(Tripathy,2011).It is due to the increase in the rise in the price of the

agricultural inputs like fertilisers, pesticides, wages etc. So, the cost of production is becoming high and less than the credit provided by financial institutions.

2. LITERATURE REVIEW

Muniraj (1987) has observed in his work, that farm finance is the money extended to the farmer to stimulate the productivity of limited farm resources. It is not a mere loan or credit or advance. It is an instrument to promote the well being of the society. Farm finance is not just a science to manage the money but is an applied science of allocating of scarce resources to derive the optimum output. It is a lever with forward and backward linkage to the economic development both at micro and macro levels. Agricultural finance is required to the supporting infrastructure for adoption of new technology. It is supported by Ojha (1987) in his work. He has concluded that credit in agricultural sector serves as an instrument for stimulating increase in production, income and employment.

Rayudu and Naik (1991) have stated, that a large sector of rural community in India live in subsistence economy and therefore they have to depend upon outside finance for financing their activities From the study of Mishra (1995) it is revealed, that the revolution initiated through the changes in approach of the fourth five-year plan envisaged that modernizing agriculture, is more or less a technology of inputs and its judicious management on scientific basis. This new situation calls for greater financial investment on the part of farmers for purchasing of inputs. Consequently, the provision of credit to farmer on liberal term and condition became the sine-qua-non of agricultural development in the country. So, adequate amount of credit is an important factor for agricultural developments. But Indian agriculture is dominated by small and marginal farmers and land less labourers.

They are not in a position to purchase the inputs for agriculture due to fund constrain. Srivastav (1995) has emphasized on the importance of institutional credit and suggested that bank should provide adequate credit to agricultural sector for increasing production and productivity which leads

to the prosperity of the nation. Gurumoorthy (1995) has said that agriculture is predominant in India and the entire economy depends upon it. Timely credit is one of the important ingredients for survival and growth of agricultural sector. Credit is an important input in the agricultural development, as it facilitates access to resources and services. Moreover, credit for agriculture serves as an important instrument for stimulating increase on production, income and employment. Karmakar(2011) has stressed on poor outreach of institutional credit. Although the total agricultural credit has increased during the last six years, there are serious quantitative and qualitative concerns. The poor outreach of the formal institutional credit structure is a serious issue that needs to be corrected expeditiously.

The above literature review shows the importance of institutional short term credit for development of agricultural sector. But, specifically the discussion on and solution of the problem of the credit deficit i.e. the difference between the cost of production and short term institutional credit is found to be lacking. So, in this paper an attempt has been made to discuss and recommend to solve the problem of the credit deficit faced by the farmers.

3. OBJECTIVES

`   The objectives of the study are:

i) To examine the credit deficit (i.e. difference between cost of production and short term institutional credit availed) per acre and per farm across the different villages and size of farms under study

ii) To deduce certain findings for an effective concluding remarks for financial institutions and policy makers.

4. DATA BASE AND METHODOLOGY

The present study is confined to Bargarh district of Orissa state of India which lies between 20º 43' N and 22º 11' N latitudes and 82º 39' E and 85º 13' E longitudes and its rice (Paddy) cultivation. Bargarh district is an agriculturally developed district and considered the rice bowl of western Orissa. In this study both the primary and secondary sources of data have been collected. Mainly this study is based

on the primary source of data collected through a pre-designed questionnaire. But, the help of secondary source of data collected from the published/unpublished records of primary Agricultural Societies/ Cooperative Banks, Commercial Banks and other sources has been taken to cross check the primary data pertaining to credit and certain other aspects for the year under study 2009-10. The villages were selected by stratified random sampling method. The selections of the sample cultivators of the sample villages are made on the basis of census method. It means all the farm households (based on their operational holdings) of the selected sample villages are considered for the present study.

The farms in each village under study are divided into 3 categories such as Small (Upto 5 acres), Medium (5.01 to 10 acres) and Large (more than 10 acres) farms based on the operational holdings. Altogether 454 samples were collected from three sample villages under study i.e. one village is chosen from irrigated (double crop area) pocket, the other one from semi-irrigated (where irrigation for one crop i.e. khariff crop is assured) and the other from rain fed (non-irrigated) pocket. The institutional agricultural credit (Short-term credit i.e. crop loan) availed by the farmers of different villages and cost of production during the year under study have only considered for the purpose of present study. The information on short-term institutional agricultural credit along with cost of production for one agricultural year 2009 -2010 (that is June 2009– December 2009) for Khariff and (January 2010 – June 2010) for Rabi have been collected.

To test the significant difference in the credit deficit across the villages and farm sizes and the 'F' value is found out by TWO-Way ANOVA Table where the Villages (3 villages - irrigated, semi-irrigated and non-irrigated) and Farm sizes (3 size classes - Small, Medium and Large) are known as Column and Row elements respectively.

$$F_t = \frac{S_t^2}{S_E^2} \quad \sim F(k\text{-}1),(h\text{-}1)(k\text{-}1)$$
$$\textit{for column (i.e. villages)}$$

$$df = k\text{-}1 = 2$$
$$df = (h\text{-}1)(k\text{-}1) = 4$$

$$F_v = \frac{S_v^2}{S_E^2} \quad \sim F(h\text{-}1),(h\text{-}1)(k\text{-}1)$$
$$\textit{for row (i.e.farm sizes)}$$

$$df = h\text{-}1 = 2$$
$$df = (h\text{-}1)(k\text{-}1) = 4$$

An alternative hypothesis (H_1) is accepted/null hypothesis (H_0) is rejected if calculated value of F is greater than its tabulated value at the corresponding degree of freedom (df) and level of significance.

5.   HYPOTHESES

The hypotheses taken for the purpose of the present study are mentioned below:-

i. H_0: There is no significant difference in 'credit deficit' per acre across the villages.
       H_1: There exists a significant difference in 'credit deficit' per acre across the villages.

ii. H_0: There is no significant difference in 'credit deficit' per acre across the farm sizes.
       H_1: There exists a significant difference in 'credit deficit' per acre across the farm sizes.

iii. H_0: There is no significant difference in 'credit deficit' per farm across the villages.
       H_1: There exists a significant difference in 'credit deficit' per farm across the   villages.

iv. H_0: There exists a significant difference in 'credit deficit' per farm across the farm sizes.
       H_1: There exists a significant difference in 'credit deficit' per farm across the farm sizes.

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6.   RESULT ANALYSIS

The result of the study has been analysed in two sections. In **Section-I** the size distribution of farms , land holding and operation of area in acres according to size group holding and in **Section-II** the farm credit availed, cost of production, credit deficit and credit deficit per farms and per acres have been analysed.

Section-I

The study of size distribution of farms according to size group holding is important to observe the socio-economic characteristic of the

farmers in agricultural sector. However, the study of land holding and operation of area in acres is also equally important to examine the credit worthiness of the farmers. So, in this paper both the size distribution of farms as well as land holding and operation of area in acres according to size group holding have been analysed.

The size distribution of farms according to size group holding in the study villages is shown in table-1.

It is observed from the table-1 that the small farms form 59.75%, 54.7%, 40% and 51.5% in V_1, V_2, V_3 and all V respectively. The medium farms form 35.06%, 32%, 33.33% and 33.5% in V_1, V_2, V_3 and all V respectively. Similarly, the large farms form 5.19%, 13.3%, 26.7% and 15% in V_1, V_2, V_3 and all V respectively. The most interesting characteristic of the farms is that most of the farms belong to the small category, whereas the large category of the farm forms the least.

Table-1 :
Size Distribution of Farms According To Size Group Holding

Village / Farm Size	No. of farms	Percentage of farm in the group
V_1 : Irrigated		
Small	92	59.75
Medium	54	35.06
Large	08	5.19
Total	154	100
V_2 :Semi-Irrigated		
Small	82	54.66
Medium	48	32.00
Large	20	13.33
Total	150	100
V_3 : Non-Irrigated		
Small	60	40.00
Medium	50	33.33
Large	40	26.66
Total	150	100
V : All V		
Small	234	51.54
Medium	152	33.48
Large	68	14.97
Total	454	100

Sources: *Field Survey*

However, the areas owned and operated in the study villages shown in table-2 show a different picture.   In V1 maximum acres of land are being owned and operated by the medium farmers i.e. 48.99%. Next to them 37.63% of lands are being owned and operated by small farmers. Only 13.38% of lands are being owned and operated by the large farmers. The same scenario is seen in V2. Maximum lands are being owned and operated by the medium farmers, next to them the small and large farmers. But in V3 the large farmers own and operate maximum land whereas the small farmers minimum. As a whole in all V maximum lands are being owned and operated by the medium farmers. Next to the medium farmers the small and large farmers own and operate less.

13

Table-2:
Size Distribution of AreaAccording To Size Group Holding (in acres)

Village / Farm Size	Acres of land holding & Operated	Percentage
V$_1$: Irrigated		
Small	306.50	37.63
Medium	399.00	48.99
Large	109.00	13.38
Total	814.50	100.00
V$_2$:Semi-Irrigated		
Small	284.00	31.94
Medium	355.00	39.93
Large	250.00	28.13
Total	889.00	100.00
V$_3$: Non-Irrigated		
Small	200.00	17.85
Medium	370.00	33.04
Large	550.00	49.11
Total	1120.00	100.00
V : All V		
Small	790.50	27.99
Medium	1124.00	39.81
Large	909.00	32.20
Total	2823.00	100.00

 Sources: *Field Survey*

Section-II

Cost of production includes the cost incurred for the use of HYV seeds, fertilizers, pesticides, hired human labour, machine labour and others. However, the formal farm credit is the institutional short term credit sanctioned by banks and financial institutions and availed by the farmers for agricultural purpose. The difference between formal farm credit availed and cost of production is the credit deficit.

The Cost of production, formal farm credit availed and credit deficit are shown in table-3.

It is observed from the above table-3 that in irrigated village (V1) the credit deficit is found highest in case of medium farm then by small and large farms respectively. The same picture is seen in semi irrigated village (V2). That means like the irrigated village, in semi-irrigated village(V2) the credit deficit is found highest in case of medium farm followed by small and large farms. In non irrigated village (V3), like the semi irrigated village (V2) the credit deficit is found highest in case of medium farm. But it is first followed by large, then by small farms. In all villages (V) the credit deficit is found highest in case of medium farm followed by large and small farms respectively

The "Credit Deficit" per acre and per farm is shown in table-4. From the table-4, it is observed that in irrigated village (V1) the credit deficit per acre is found highest in case of medium farm then by small and large farms. Like this in the same village the credit deficit per farm is also found highest in case of medium farm. But it is followed by large and small farm respectively. In semi irrigated village (V2), like the irrigated village (V1) the credit deficit per acre is

14

Table – 3:
Cost of production, formal farm credit availed and credit deficit (in Rs.)

Nature of Villeges	Size of farms	Total Institutional short term credit	Cost of production of farm	Credit deficit
Irrigated	Small	1456000	1849530	-393530
	Medium	2028800	2559885	-531085.14
	Large	475000	550760	-75760
	Total	3959800	4960174.76	-1000374.76
Semi-Irrigated	Small	830000	856549.96	-2654996
	Medium	919000	1296209.92	-377209.92
	Large	660000	869420	-209420
	Total	2409000	3259980	-850980
Non-Irrigated	Small	372000	425550	-53550
	Medium	520000	746790	-226790
	Large	658000	1105730	-477730
	Total	1550000	2170970	-620970
All Villages	Small	2658000	3662330.74	-604330.74
	Medium	3467800	4602884.32	-1135084.32
	Large	1793000	2525910.12	-732910.12
	Total	7918800	10391125.10	-2472325.10

Sources: *Field Survey*

Note:

1) *The institutional short term credit is the formal farm credit sanctioned by banks and financial institutions and availed by the farmers for agricultural purpose.*

2) *The total cost of production = cost incurred for the use of HYV seeds + fertilizer + pesticide +hired labour +machine labour+ others.*

3) *The cost of production of the Post loan period is only considered here.*

4) *Credit Deficit per acre/farm refers to the difference between formal farm credit availed and cost of production.*

found highest in case of medium farm followed by small and large farms. However, it shows a different picture in credit deficit per farms. The credit deficit per farm in this village is found highest in case of large farm followed by medium and small farms. In non irrigated village (V3), like the semi irrigated village (V1) the credit deficit per acre is found highest in case of large farm. But it is first followed by medium, then by small farms. Similarly the credit per farm in this non irrigated village is also found highest in case of large farm followed by medium and small farms simultaneously. In all villages (V) the credit deficit per acre is found highest in case of

medium farm followed by large and small farms respectively. But the credit deficit per farm is different. It is found highest in case of large farm followed by medium, also by small farms respectively.

This result analysis is supported by the 'F'-test found out by two way-ANOVA test represented in table-4.

7.   TESTING OF HYPOTHESES

The hypotheses taken for the study are tested as follows based on the result of 'F' Test shown in the table-4.

Table – 4:
Credit Deficit Per Acre And Per Farm Across The Villages And Farm Sizes (in Rs.)

Nature of villages	Size of farms	Credit deficit per acre	Credit deficit perfarm
Irrigated	Small	-1283.95	-4277.50
	Medium	-1331.04	-9834.91
	Large	-695.05	-9470.00
	Total	-1228.21	-6495.94
Semi-Irrigated	Small	-930.81	-323.78
	Medium	-1062.56	-7858.54
	Large	-837.68	-10471.00
	Total	-957.23	-5673.20
Non-Irrigated	Small	-267.75	-892.50
	Medium	-612.95	-4535.80
	Large	-814.05	-11193.25
	Total	-554.44	-4139.80
All Villages	Small	-764.49	-2582.61
	Medium	-1009.86	-7467.66
	Large	-806.28	-10778.09
	Total	-875.62	-5445.65
'F' Value column **df**$_{(2,4)}$ (i.e. across Villages)		**2.27**	**1.66**
'F' Value Row **df**$_{(2,4)}$ (i.e. across Farms)		**0.51**	**12.33***

Sources: *Field Survey*

Note:

1) $F_t = \dfrac{S_t^2}{S_E^2}$ $\sim F(k-1),(h-1)(k-1)$ *for column (i.e.villages)*
   $df = k-1 = 2$ $df = (h-1)(k-1) = 4$

   $F_v = \dfrac{S_v^2}{S_E^2}$ $\sim F(h-1),(h-1)(k-1)$ *for row (i.e. farm sizes)*
   $df = h-1 = 2$ $df = (h-1)(k-1) = 4$

2)   ** Significant at 5% level of significance*   3)   *Tabulated Value = $F_{0.05}$ (2,4) = 6.94*
4)   *In Column the 3 villages i.e. V_1, V_2 and V_3 were considered*
5)   *In Row the 3 size classes of farms i.e. small, medium and large farms were considered.*

Hypothesis No.1: There exists a significant difference in 'credit deficit' per acre across the villages. This hypothesis is rejected. Null hypothesis (H_0) is accepted.

Hypothesis No.2: There exists a significant difference in 'credit deficit' per acre across the farm sizes.
This hypothesis is rejected. Null hypothesis (H_0) is accepted.

Hypothesis No.3: There exists a significant difference in 'credit deficit' per farm across the villages.
This hypothesis is rejected.
Null hypothesis (H_0) is accepted.

Hypothesis No.4 : There exists a significant difference in 'credit deficit' per farm across the farm sizes. This alternative hypothesis (H_1) is accepted at 5% level of Significance for $F_{(2,4)}$ = 12.33. Null hypothesis is rejected.

16

The amount of formal farm credit requirement to the extent of deficit of credit over cost of production per acre and per farm as shown in table-4 is felt across the farm sizes and villages under study. The difference between formal farm credit and cost of production i.e. credit deficit per acre varies with variation of farm sizes and villages. However, it is not found significant across the villages and farm sizes under study. It means on an average all categories of the farms are realizing deficit in the formal farm credit requirement to meet their cost of production in all the villages. Besides, the credit deficit per farm across the villages is also not significant. But across the farm sizes it is found significant at 5% level for $F_{(2,4)}$ = 12.23. It means the credit requirement per farm varies with the variation of farm sizes but not across villages. It indicates that in all villages there exists credit deficit.

8.   SUMMARY AND MAJOR FINDINGS

It is found that there is an insignificant difference in credit deficit per acre across the villages, per farm across the villages and per acres across the farm sizes. This deficit may be due to the homogeneity in getting the credit limit per acre by the financial institution for different categories of farm as per the prescribed Govt. rules. So far the credit limit

is concerned; the amount is same in irrigated and semi-irrigated villages irrespective of farm sizes. Although there is a difference in the credit limit in irrigated and non-irrigated village, but an equal amount of credit per acre is sanctioned in non-irrigated villages irrespective of farm sizes. However, there exists a significant difference in credit deficit per acre per farm across the farm sizes. The significant difference is mainly due to more credit deficit in medium farms and large farms in comparison to small farms. The credit deficit is more in case of medium and large farms because the cost of production as found from our data is highest in case of large farms and lowest in case of small farms.

9.   CONCLUSION

Thus, it is high time now that the policy makers should take all possible measures/steps to meet the credit deficit of the farmers. Not only this but also there should be wide coverage of short term institutional credit, so that farmers can be able to avail affordable, adequate and timely credit to purchase and use the inputs for better agricultural production. The role of money lenders will also be minimised and the farmers can extend desired contribution to strengthen the economy.

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