Performance of Factors Influencing Agricultural Credit Flow in Odisha

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The present study was conducted to analyze different factors influencing the institutional credit flow to agriculture along with their contribution in explaining the variation in flow of agricultural credit in Odisha. For the study three sample districts have been taken based on their C:D ratio i.e. Jajpur, Puri and Cuttack. Almost every factors selected have posed significantly positive impact on credit flow of institutional agencies for agriculture and allied activities. Stepwise regression has been followed to check particular factor explaining maximum variance in credit flow and the results revealed that the predictors that influenced flow of agricultural credit significantly has been irrigation and bank deposit in case of Puri district where as bank deposit, irrigation and literacy for Jajpur district and bank branches and bank deposits in case of Cuttack district. Bank deposit has been the common factor explaining maximum variance in agricultural credit flow in Jajpur, Puri and Cuttack because it has been quite obvious as bank's net credit is dependent on deposit mobilization. Computerization of land records and proper procedure of imparting training to borrowers should be occurred for facilitating institutional lending.

Introduction

India is an agrarian economy; where above 58 percentages of rural households depend upon agriculture for their primary means of livelihood. Agriculture contributes 17.4 percentages towards Gross Domestic Product (GDP) and employs 2/3 of labour to the total work force (Arabi 2011). Credit is not only one of the critical inputs in agriculture but is also an effective means of rural development. A large number of agencies, including co-operatives, regional rural banks (RRBs), commercial banks, non-banking financial institutions, self-help groups (SHGs) and well-spread informal credit outlets together constitute the Indian rural credit delivery system. One of the objectives of the credit policy is to minimize the role of non-institutional sources, mainly the money-lenders in the flow of agricultural credit.

Several initiatives have been taken in this regard since Independence. Some major milestones in rural credit are the acceptance of Rural Credit Survey Committee Report (1954), nationalization of major commercial banks (1969 and 1980), establishment of RRBs (1975), establishment of National Bank for Agriculture and Rural Development

(NABARD) (1982) and the ongoing reforms in the financial sector since 1991 (Vyas *et al.,* 2004, Sinha *et al.,* 2006). The term "Credit" refers to a particular sub-set of financial services which provides small loans to very poor and tribal families, most often without any collateral. The provision of credit and generation of savings has long been recognized as an essential element in any rural development strategy.

Credit plays a crucial role in the modernization of agriculture, but its role in the fight against rural poverty has seldom been recognized (Islam *et al.,* 2014). In one hand the majority of the people depend on agricultural activities and on the other hand, they are lacking in capital for investment which compels them to knock the door of any financial institutions either formal or informal.

Agricultural credit flow is usually affected by various factors having significant contribution in boosting the performance of agricultural production outreach. The flow of credit for agriculture and allied activities was found to increase or decrease according to the changes occurred in several factors like land holding, irrigated area, gross cropped area, number of bank branches, amount of deposits, literacy level of the farmers and rainfall. Against this backdrop, the present study was undertaken to analyze different factors which have influenced the flow of credit and apart from that analysis has been carried out regarding the factors which has explained maximum variance in flow of agricultural credit.

Materials and Methods

For the study three districts of Odisha have been selected based upon their C:D ratio which was Jajpur, Puri and Cuttack. Regarding analysis various factors that have been influencing the flow of agricultural credit, correlation analysis have been used to show that with which of the factors, there has been a significant correlation. To assess the most predicting factors among all selected factors which has explained maximum variance in flow of agricultural credit, multiple linear regression followed by step wise regression has been followed in the study.

Results and Discussion

Stepwise regression is a semi-automated process of building a model by successively adding or removing variables which has been used to find exactly which factor(s) influence the credit flow in each sector across the districts of Odisha. Credit flow in agricultural sector varies from districts to districts in terms of actions of numerous factors like amount of deposits, number of accounts, average landholding, rainfall, irrigation, literacy and others.

The selection of variables was based on some apriori expectations so that these variables provide sufficient economic explanations. Irrigation was taken as a proxy for agricultural infrastructure; literacy variable has represented the extent of development in the social circle. Both land holdings and GCA were taken as representations of technological advancement in agriculture, and rainfall was taken as proxy for climatic factor. The network of banking infrastructure, bank deposit, and number of accounts were intuitively taken as a determining factor on quantum of credit flow. These factors exerted their influence considerably on the flow of credit under a condition of availability of financial resource from lending institutions.

Puri district

The result of the stepwise regression as shown in Table 1 (b) further predicted the actual

factors influencing the credit flow from the multiple regression Table 1 (a). It was revealed that deposit has been the most influencing factor that determined the flow of agricultural credit in Puri district with coefficient of 1.23 which was significant at 1 per cent level and with coefficient of determination of 0.938. However, this was high as compared with irrigation, as the second factor influencing credit flow with a coefficient of 3.12 significant at 1 per cent level and a change in coefficient of determination to 0.989. This result made deposit and irrigation as the predictors in the model. On the contrary, literacy had negative coefficient with agricultural credit [Table 1 (a)].

Deposit explained the maximum variance in agricultural credit followed by irrigation. This could be linked with the report of on achievements of water resources by directorate of water management that identified Puri district as one of the coastal district where the summer and winter rainfall is meager and erratic which has lessened the availability of soil moisture and as a result of which supplemental irrigation has become mandatory for the rabi crops.

Poor acquifer and saline ground water conditions also added the effect of limiting the crop production and as a result of which irrigation has got much attention to relieve out from these stressful situations.

Jajpur district

The result in Table 2 (b) revealed that deposit was the most influencing factor that determined flow of institutional credit to agricultural sector in Jajpur district with a coefficient of 0.27 which is significant at 1 per cent level and a coefficient of determination of 0.948. This was followed by irrigation having a coefficient of 39.4 at 1 per

cent level of significance and a change in coefficient of determination to 0.984.

The third factor was literacy with coefficient of 6285.45 significant at 1 per cent and a change in coefficient of determination to 0.987. It was inferred from the results that the predictors in the model were deposit, irrigation and literacy. On the contrary, number of accounts and rainfall had negative coefficients with agricultural credit [Table 2 (a)].

Bank deposit explained the maximum variance in agricultural credit. This could be explained by RBI policy mandate on schedule commercial bank and RRBs to advance 40 and 60 per cent respectively of their net bank credit to priority sector, of which agriculture is given first preference. Hence, since the bank's net credit is dependent on their level of deposit mobilization, the level of agricultural advance is thus directly affected by the level of bank deposit. The irrigation has been the second most factors affecting the flow of agricultural credit which also symbolized the district's involvement in irrigation project to foster crop growth and this could influence considerably any institution who wants to give credit / loan to be assured that the farmer is not basically dependent on rainfall for the success in production.

Cuttack district

The result of the stepwise regression as shown in Table 3 (b) further predicted the actual factors influencing the credit flow from the multiple regression Table 3 (a). It was revealed that deposit is the most influencing factor that determined the flow of agricultural credit in Cuttack district with coefficient of 3.47 which was significant at 1 per cent level and with coefficient of determination of 0.929. However, this was high as compared with literacy, as the second factor influencing

credit flow with a coefficient of 2.53 significant at 1 per cent level and a change in coefficient of determination to 0.975. This result made deposit and literacy as the predictors in the model.

Table.1 (a) Factors influencing flow of credit to agricultural sectors in Puri district (Multiple regression analysis)

Model	Co-efficient	Standard. Error	t-value	Significance
Constant	4.76	2.04E+05	0.78	0.58
Irrigation	28.37	0.824	3.85**	0.043
Rainfall	279.49	513.6	0.54	0.678
Land Holding	27.67	0.729	4.29*	0.032
Bank Branches	5832.57	298.14	2.34	0.287
Deposit	37.7	0.023	4.94**	0.004
Literacy	-5350.9	476.56	-1.09	0.453
Gross Cropped area	5.32	7.65	0.4	0.675
Number of Accounts	54.35	22.48	1.75	0.432

Note: **: Significance at 1per cent level *: Significance at 5per cent level
Dependent variable: Agricultural credit

Predictive equation for factors influencing flow of credit to agricultural sectors in Puri District

Regression Equation	r	R^2	Standard Error	F Value	Significance
Y= 4.76+28.7X1*+279.49X2-27.67X3*+5832.57X4+37.37X5**-5350.9X6+5.32X7+54.35X8	0.90	0.919	6542.87	118.78	0.045

Where,
X1- Irrigation X3- Land holding X5- Deposit X7- Gross cropped area (GCA)
X2- Rainfall X4- Bank branches X6- Literacy X8- Number of Accounts

Table.2 (a) Factors influencing flow of credit to agricultural sectors in Jajpur district (Multiple regression analysis)

Model	Co-efficient	Standard. Error	t-value	Significance
Constant	5.35	3.01E+05	0.78	0.632
Irrigation	34.65	0.341	1.05*	0.042
Rainfall	-564.23	154.12	-0.49	0.643
Land Holding	76.56	135.16	2.71*	0.045
Bank Branches	1128.87	1623.65	0.83	0.478
Deposit	36.65	0.135	2.78**	0.008
Literacy	25.65	0.651	5.23*	0.034
Gross Cropped area	7.54	6.23	1.12	0.425
Number of Accounts	8.45	7.23	1.08	0.48

Note: **: Significance at 1per cent level *: Significance at 5per cent level
Dependent variable: Agricultural credit

Predictive equation for factors influencing flow of credit to agricultural sectors in Jajpur District

Regression Equation	r	R^2	Standard Error	F Value	Significance
$Y= 5.35+34.65X1*-564.23X2$ $+76.56X3*+1128.87X4+36.65X5**+25.65X6*+7.54X7+8.45X8$	0.89	0.989	2638.59	132.08	0.041

Where,
X1- Irrigation   X3- Land holding   X5- Deposit   X7- Gross cropped area (GCA)
X2- Rainfall   X4- Bank branches   X6- Literacy   X8- Number of Accounts

Table.2.1 (b) Contribution of factors affecting flow of credit to agricultural sector in Puri district
(Stepwise regression models)

Model	Co-efficient	Standard Error	t-value	Significance	R^2
Constant	-1.09	1.42E+00	-5.2	0.093	0.919
Deposit	3.12	3.65	5.43**	0.004	
Irrigation	1.23	7.87E-01	1.40**	0.001	

Note: **: Significance at 1per cent level
Dependent variable: Agricultural credit

Selected variables along with R^2

Deposit	Irrigation
Deposit	
R^2	
.919	
.898	

Table.2 (b) Contribution of factors affecting flow of credit to agricultural sector in Jajpur district
(Stepwise regression models)

Model	Co-efficient	Standard Error	t-value	Significance	R^2
Constant	-52340	9.58E+03	-3.67	0.193	0.927
Deposit	58.45	2.30E-02	12.786**	0.000	
Irrigation	12.27	9.42	4.37**	0.005	
Literacy	39.4	8.32	2.34*	0.049	

Note: **: Significance at 1per cent level
Dependent variable: Agricultural credit

Selected variables along with R^2

Deposit	Irrigation	Literacy
Deposit		Irrigation
Deposit		

R^2
.927
.904
.878

Table.3 (a) Factors influencing flow of credit to agricultural sectors in Cuttack district (Multiple regression analysis)

Model	Co-efficient	Standard. Error	t-value	Significance
Constant	6.54	1.76E+05	0.71	0.05
Irrigation	41.2	6.14	4.85*	0.021
Rainfall	243.49	479.6	0.85	0.581
Land Holding	35.21	5.34	3.38*	0.043
Bank Branches	32.75	5.25	5.23**	0.004
Deposit	49.657	2.42	5.72**	0.009
Literacy	50.9	6.72	-3.68	0.195
Gross Cropped area	7.23	34.12	3.21	0.568
Number of Accounts	25.58	19.67	1.75	0.345

Note: **: Significance at 1per cent level *: Significance at 5per cent level
Dependent variable: Agricultural credit

Predictive equation for factors influencing flow of credit to agricultural sectors in Cuttack District

Regression Equation	r	R^2	Standard Error	F Value	Significance
Y= 6.54+41.2X1*+243.49X2+35.21X3* **+32.75X4**+49.657X5**+ 50.9X6+7.23X7+25.58X8**	0.87	0.905	537.32	97.65	0.043

Where,
X1- Irrigation   X3- Land holding   X5- Deposit   X7- Gross cropped area (GCA)
X2- Rainfall   X4- Bank branches   X6- Literacy   X8- Number of Accounts

Table.3 (b) Contribution of factors affecting flow of credit to agricultural sector in Cuttack district (Stepwise regression models)

Model	Co-efficient	Standard Error	t-value	Significance	R^2
Constant	-2.65	1.27E+00	-3.5	0.082	0.905
Deposit	3.47	5.32E-01	2.76**	0.005	
Bank Branches	2.53	1.01	3.29**	0.007	

Note: **: Significance at 1per cent level

Dependent variable: Agricultural credit Selected variables along with R^2

Deposit	Bank Branches
Deposit	

R^2
.905
.869

Deposit explained the maximum variance in agricultural credit followed by bank branches. This could be explained by RBI policy mandate on schedule commercial bank and RRBs to advance 40 and 60 per cent respectively of their net bank credit to priority sector, of which agriculture is given first preference. Hence, since the bank's net credit is dependent on their level of deposit mobilization, the level of agricultural advance is thus directly affected by the level of bank deposit. Similar results has also seen in a study by Gupta (2007).

In conclusion all the selected factors were found to have significant positive influence on the flow of agricultural credit to the all three sample districts. Among the chosen factors, bank deposit was the common factor explaining maximum variance in agricultural credit flow in Jajpur, Puri and Cuttack because it has been quite obvious as bank's net credit is dependent on deposit mobilization. Irrigation has played significant influence to credit flow both in Puri and Jajpur districts which also symbolized the district's involvement in irrigation project to foster crop growth and this could influence considerably any institution who wants to give credit / loan to be assured that the farmer is not basically dependent on rainfall for the success in production. There should be computerization of land records by the state government will facilitate institutional lending. Proper procedure of imparting training to borrowers regarding procedural formalities of financial institutions could be helpful in increasing their access to institutional credit.

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