



FACTORS INFLUENCING OVERDUES OF TRIBAL BORROWERS IN JHARKHAND STATE OF INDIA: A POLICY PERSPECTIVE

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Abstract- Utilization and repayment of borrowed agricultural loans has been one of the numerous of agricultural development in the developing world and India is no exception. As such, this study focused on to identify the factors which influence overdues of tribal borrowers in Jharkhand State of India. A sample of 240 borrowers was selected by multistage sampling technique for analyzing the problem of overdues. In estimating problem of overdues of the borrowers, the linear discriminant function analysis was employed and results showed that income and farm experience made the most significant contributions to the discrimination to the tune of 39.38 per cent and 15.10 per cent respectively. Other socio economic factors that contributed to the discrimination between defaulters and non-defaulters were age (11.95 per cent) land holding size (9.99 per cent), irrigation potential (9.48 per cent), amount borrowed (9.10 per cent) and family size (5.40 per cent). On the other hand education had a negative contribution of -0.40 per cent and cropping intensity has no contribution to discrimination between defaulters and non-defaulters.

Keywords- Agriculture loan, Overdues, Tribal borrowers, Discriminant function analysis, Defaulter and non-defaulter

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Introduction

It is an accepted fact that agricultural growth is required for overall economic development in a country like India. Agricultural growth depends on the growth of productivity that in turn requires sustained infusion of capital. Adequate and timely availability of institutional credit plays a pivotal role in agricultural development, particularly in enhancing its productivity and improving the living standard of the peasant communities. It accelerates the pace of agricultural development if it is adequate in quantity, cheap, and timely made available [1, 2, 3]. It enables the peasants to undertake new investments and/or use of modern agricultural technologies to boost up agricultural production [4]. The total agriculture credit of all banks together in the Jharkhand is Rs. 69.63 billion which constitutes 13.33 per cent of the gross credit during the year 2012-13 [5]. Agriculture credit in the state is lower than the national bench mark of 18 per cent. However, it is showing an increasing trend over the years. Although the growth in the flow of agricultural credit is increasing in Jharkhand, the state is also not free from the sicknesses that have afflicted the institutional credit agencies in the India as a whole. Agricultural credit is not only an issue of quantity but of quality also. The increased availability of institutional credit has given rise to many related problems such as inadequacy, misutilization, lack of timeliness in credit delivery etc. which directly or indirectly have a bearing on the repayment of the loan and therefore the overdues levels. The overdues of agriculture sector advances of institutional credit agencies have been mounting in Jharkhand from its estab-

lishment. During the year 2012-13, demand for agriculture credit was Rs. 16.66 billion and recovered only Rs. 10.32 billion means there are 32 per cent overdues in the state. Since the efficiency and effectiveness of the flow of credit depends on the delivery mechanism at the beneficiaries level a sound rural credit system shall advance the right quantum of credit to meet the working capital requirements of the borrowers at right time, so that it is utilized properly in the production process so as to generate a surplus, which will be utilized to repay the principal plus interest amount. The study aims to identify the factors which influence overdues of the borrowers and suggest suitable policy measures.

Methodology

Sampling Procedure

A multistage sampling technique was used in the selection of districts, blocks, villages and borrowers. The study was conducted in Jharkhand state which was purposively selected because the researcher has knowledge and he is familiar with the locality. Jharkhand state consists of 24 districts out of which one-third were selected purposively on the basis of higher percentage of tribal population as per population census 2001 of India. These districts were: Simdega (72.45 per cent), Khunti (72.39 per cent), Gumla (69.75 per cent), West Singhbhum (66.41 per cent), Lohardaga (56.41 per cent), Pakur (49.32 per cent), Dumka (46.62 per cent) and Latehar (45.30 per cent). One block was randomly selected from each district. Thus total numbers of 8 blocks i.e., Thethaitangar from Sim-

dega district, Khunti from Khunti district, Bharno from Gumla district, Sadar Chaibasa from West Singhbhum district, Bhandra from Lo-hardaga district, Pakuria from Pakur district, Dumka from Dumka district and Latehar from Latehar district were randomly selected. A complete list of villages involved in bank borrowing in the sample blocks was prepared and two villages were randomly selected from each block and a total number of 16 villages namely Joram and Jampani from Thethaitangar block, Lamlum and Ramrong from Khunti block, Bharno and Turiamba from Bharno block, Mesenda and Tonda from Sadar Chaibasa, Bhandra and Masmano from Bhandra block, Paliadaha and Khasa from Pakuria block, Jhitki and Sarsaria from Dumka block and Pasu and Arahara from Latehar block were selected. List of borrowers were obtained from banks and a total number of 15 borrowers were selected randomly from each village. Out of 15 borrowers, 10 borrowers were those who were paying their loan and 5 borrowers were those who were in the category of defaulter. Thus, altogether 240 borrowers were finally selected from 16 villages.

Analytical Techniques

Discriminant Function Analysis

In order to measure the net effect of each variable in this analysis in all other variables were taken as constant by using discriminant function approach. The relative importance of the study in regards to their power to discriminate between the groups of non-defaulters and defaulters and further between the non-willful and willful defaulters [6]. The general model used for the present study is as follows:

$$Z = y_1X_1 + y_2X_2 + y_3X_3 + y_4X_4 + y_5X_5 + y_6X_6 + y_7X_7 + y_8X_8 + y_9X_9$$

where,

Z = Total discriminant score for defaulters and non-defaulters

X₁ = Age of the borrower in year

X₂ = Education (Scored 0 for illiterate, 1 for 1st– 5th class, 2 for 6th– 10th class, 3 for 11th– 12th class and 4 for graduation and above)

X₃ = Family size in numbers

X₄ = Farming experience in years

X₅ = Income of the farmer in Rs.

X₆ = Land holding size in acres

X₇ = Amount borrowed (Rs. in thousands)

X₈ = Cropping intensity in percentage

Cropping intensity = (Gross cropped area/ Net sown area) X 100

X₉ = Irrigation potential in percentage

Irrigation potential = (Total area under irrigation/ Total cultivated area) X 100

y₁.....y₉ = are the coefficient of linear discriminant function.

The method seeks to obtain the coefficients such that the squared distance between the mean Z score for one group and the mean Z score for the other groups is as large as possible in relation to the variations of the Z score within the group. The study does not assume that the variance and covariance matrices of the groups are the same. This is the reason why the discriminate functions for each population are different.

The Discriminant function was tested for the significant to know whether or not these selected variables taken together were sufficiently discriminating the two groups or not. The overall significance

of the estimated Discriminant function was tested with the help of Fisher's 'F' test is calculated as:

$$F = \frac{R^2(n-p-1)}{(1-R^2)(p)}$$

$$R^2 = \alpha\theta \frac{(n_1n_2)}{(n_1 + n_2)}$$

$$\alpha = S^{-1}\theta$$

$$S = \begin{pmatrix} \sum X_1 & \sum X_2 \sum X_2 \\ \sum X_1 X_2 & \sum X_1^2 \end{pmatrix}$$

$$\theta = \begin{pmatrix} X_{11} & -X_{12} \\ X_{21} & -X_{22} \end{pmatrix}$$

where,

p = Number of variables considered in the function

n₁= Number of non-defaulters/non-willful defaulters

n₂= Number of defaulters/willful defaulters

The value of 'F' is tested at p and (n₁+ n₂- p-1) degree of freedom.

Results and Discussion

Borrowers have been categorized as defaulters and non-defaulters on the basis of loan repayment by the borrowers. The defaulters are those who have not repaid their loans and non-defaulters are those who repaid their loan. Nine factors namely age, education, family size, experience, land holding size, amount borrowed, cropping intensity and irrigation potential were taken to discriminate between defaulters and non-defaulters. Out of 240 borrowers, 60 and 180 borrowers were identified as defaulters and non-defaulters respectively.

In estimating the problem of overdues of the borrowers, linear discriminant function analysis was employed and the result presented in [Table-1]. It could be observed that the variables made varied contribution to the loan repayment performance. Age, education, family size, farming experience, income of the borrower and land holding size were statistically significant at 1 per cent level and amount borrowed and irrigation potential both were statistically significant at 10 per cent level. Cropping intensity showed insignificant result means there was no role of cropping intensity in the problem of overdue.

Table 1- Socio-economic characteristics of defaulters and non-defaulters

Socio economic characteristics of borrowers	Mean for non-defaulter	Mean for defaulter	F- Value	df1	df2	Significance level
Age	43.91	54.13	78.596	1	238	.000*
Education	2.13	1.04	65.159	1	238	.000*
Family Size	6.43	7.95	90.859	1	238	.000*
Farm Experience	28.03	39.49	91.375	1	238	0
Income	38.91	24.5	72.894	1	238	.000*
Land Holding Size	7.01	4.67	82.833	1	238	.000*
Amount Borrowed	36.5	39.63	2.895	1	238	.090***
Cropping Intensity	117.69	118.24	0.016	1	238	0.9
Irrigation Potential	35.21	30.94	2.892	1	238	.090***

*Statistically significant at 1 per cent level

*** Statistically significant at 10 per cent level

[Table-2] shows that age, family size, farm experience, income, land holding size, amount borrowed and cropping intensity made positive relative contribution to discrimination between defaulters

and non-defaulters while education contributed negatively. By implication, the chances of the beneficiaries to belong to the group of performing loan category are enhanced by the variables with positive signs. This is on the line of previous studies [7, 6, 8].

In terms of magnitude of contribution, income and farm experience made the most significant contributions to the discrimination to the tune of 39.38 per cent and 15.10 per cent respectively. Other socio economic factors that contributed to the discrimination between defaulters and non-defaulters were age (11.95 per cent) land holding size (9.99 per cent), irrigation potential (9.48 per cent), amount borrowed (9.10 per cent) and family size (5.40 per cent). On the other hand education had a negative contribution of -0.40 per cent and cropping intensity has no contribution to discrimination between defaulters and non-defaulters.

Table 2- Relative contribution of socio-economic characteristics between defaulters and non-defaulters

SNo	Socio economic characteristics of borrowers	Standardized co-efficient	Mean difference	Coefficient X mean difference (3)*(4)	Relative contribution (%)
(1)	(2)	(3)	(4)	(5)	(6)
1	Age	0.206	10.22	2.11	11.95
2	Education	0.065	-1.09	-0.07	-0.4
3	Family Size	0.627	1.52	0.95	5.4
4	Farm Experience	0.233	11.46	2.67	15.1
5	Income	-0.482	-14.41	6.95	39.38
6	Land Holding Size	-0.753	-2.34	1.76	9.99
7	Amount Borrowed	0.513	3.13	1.61	9.1
8	Cropping Intensity	0.001	0.55	0	0
9	Irrigation Potential	-0.392	-4.27	1.67	9.48

To estimate the total discriminate score, canonical discriminant function coefficient were use to discriminate the borrowers into defaulters and non-defaulters [Table-3]. We can obtain total discriminant score by following equation:

$$Z = -2.72 + 0.26 (\text{Age}) + 0.07 (\text{Education}) + 0.54 (\text{Family Size}) + 0.03 (\text{Experience}) - 0.04 (\text{Income}) - 0.40 (\text{Land Holding Size}) + 0.04 (\text{Loan Amount}) + 0 (\text{Cropping Intensity}) - 0.02 (\text{Irrigation Potential})$$

(1)

Table 3- Canonical discriminant function coefficients for socio-economic characteristics of borrowers

SNo	Socio-economic characteristics of borrowers	Canonical co-efficient
1	Age	0.02
2	Education	0.07
3	Family Size	0.54
4	Farm Experience	0.03
5	Income	-0.04
6	Land Holding Size	-0.4
7	Amount Borrowed	0.04
8	Cropping Intensity	0
9	Irrigation Potential	-0.02
10	Constant	-2.72

Putting the mean values of the socio economic factors in the equation 1.1 we get total discriminant score of borrowers which discriminate the borrowers into defaulters and non-defaulters.

From the equation 1.1 it could be observed that total discriminant score (Z value) was 0, which discriminate the borrowers into defaulters and non-defaulters. Negative discriminant score (Z₁ value)

observed in case of non-defaulters which had value of -1.01 and positive discriminant score (Z₂ value) observed in case of defaulters with the value of 2.01. Total discriminant score is the cut-off point and deviation from its point leads to belonging to the defaulters and non-defaulters. If discriminant score increase from 0 to positive, it would leads to belong to the group of defaulter and decrease discriminant value from 0, it would leads to belong non-defaulter. Given that age, education, family size, experience and loan amount coefficients were positive sign means if we increase the value of these factors, discriminant score will be increased and borrower will be in group of defaulter. Literacy and size of landholding factors had possible relationship with default in loan repayment [9]. On the other hand, if we decrease these factors, discriminant score will be decreased and borrower will be in group of non-defaulter. Income, land holding size and irrigation potential had negative sign coefficients which indicate that if we increase these factors it would leads to decrease in the discriminant score and borrower will be in group of non-defaulter. Annual farm income had positive coefficient showing that the more productive the enterprise is, the higher the probability of loan repayment [6]. Income was favourable factors in terms of the repayment of loans [10]. Further if we decrease these factors, there will be increased in discriminant score and borrower will be in group of defaulter.

From [Table-4], the statistical test of significance of the estimated function reveals a relatively high canonical correlation coefficient of 0.819 which means the model explains 67.08 per cent of the variation in the grouping variable, i.e. whether a borrower is defaulter or not. Wilks' lambda indicates the significance of the discriminant function. It indicates a highly significant function ($p < .000$) and provides the proportion of total variability not explained, i.e. it is the converse of the squared canonical correlation. So we have 32.9 per cent unexplained variations in the model. The Chi-square value of 259.33 is significant at 1 per cent level at 9 degree of freedom, showing that there is significant difference in expected and observed frequencies.

Table 4- Statistical test of significance for the discriminant function coefficient

Canonical Correlation	Wilks' Lambda	Chi-square	df	Sig.
0.819	0.329	259.33	9	.000*

*Statistically significant at 1 per cent level

[Table-5] shows how well the function performed in classifying the borrowers into defaulters and non-defaulters. The function was predicted using a sample of 240 borrowers. The power of the model lays in its capacity to classify correctly when higher the rate, the better its predictive power of the function. With respect to the loan repayment, it was originally found that 80 borrowers were defaulters while 160 were found to be non-defaulters. On the application of the models, classification was different from the original which showed 75 and 150 borrowers for defaulters and non-defaulters respectively. In predicting group membership, same misclassification error of 6.3 per cent was made both for defaulters and non-defaulters. The classification results reveal that 93.8 per cent of borrowers were classified correctly into defaulters or non-defaulters groups. This overall predictive accuracy of the discriminant function is called the hit ratio. Defaulters and non-defaulters were classified with same accuracy of 93.8 per cent. The classification performance of the function was 93.8 per cent which is highly significant when compared with 75.6 per cent [6] and 80 per cent [11].

Table 5- Classification performance of the estimated discriminant function

Borrowers			Predicted group membership		Total
			Defaulter	Non-defaulter	
Original	Count	Defaulter	75	5	80
		Non-defaulter	10	150	160
	%	Defaulter	93.8	6.3	100
		Non-defaulter	6.3	93.8	100

Conclusion

In estimating the problem of overdue of the borrowers, the linear discriminant function analysis was employed. Age, family size, farm experience, income, land holding size, amount borrowed and cropping intensity made positive relative contribution to discrimination between defaulters and non-defaulters while education contributed negatively. In terms of magnitude of contribution, income made the most significant contributions to the discrimination and other factors like farm experience age, land holding size, irrigation potential, amount borrowed and family size made less contribution. On the other hand education had negative contribution and cropping intensity has no contribution to discrimination between defaulters and non-defaulters. It could be observed that total discriminant score was 0, which discriminate the borrowers into defaulters and non-defaulters. Negative discriminant score was observed in case of non-defaulters and positive discriminant score was observed in case of defaulters. Given that age, education, family size, experience and loan amount coefficients were positive means higher the value of these factors, higher the discriminant score and more likely that the borrower in group of defaulter. Income, land holding size and irrigation potential had negative coefficients which indicate that higher these factors it would leads to decrease in the discriminant score and more likely that the borrowers in group of non-defaulter.

Policy Measures

On the basic of finding, policy measures are laid out to improve repayment of borrowers and impart awareness to credit institutions about defaulters. There are following measures being suggested that could make the better repayment of borrowers and minimize the incidences of overdues.

Higher age group of borrowers was found to be more defaulters because they have less ability to use the credit at proper manner. Therefore, it should be taken care by credit institutions at that time of lending.

Family having large size was more vulnerable to default when they take loans. As family size increases its requirement also increase and most of the borrowers of large family size are diverting their loan for family consumption or other requirement. There should be watch over by credit institutions when advancing loan to large family size borrowers.

More experienced borrowers were found to be more defaulters. Experience did not contribute to better repayment so care should be taken by credit institutions when providing loan to experienced borrowers.

Borrowers having high income had more capability to loan repayment. Credit institutions are suggested that they should follow keen observation when advancing the loan to lower income borrowers.

Borrowers having large land holding had more potential to loan repayment. Higher the land holdings higher will be repayment ca-

capacity. In case of lower land holdings there is poor repayment and overdues. It is recommended that credit institutions should provide agriculture loan to borrowers on the basis of their land holdings.

Borrowers who took large amount of loans were found to be defaulter. Therefore, it is needed by credit institutions to advance optimum loan to borrower.

From the finding of the study, borrowers who had higher irrigation potential were recorded more capability to loan repayment. So, it is suggested that borrowers should increase their irrigation potential for better loan repayment.

Conflicts of Interest : None declared.

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