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Repayment Performance of Institutional Agricultural Credit in Jaipur District of Rajasthan

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Abstract

The present study was conducted in Jaipur district of Rajasthan. A sample of 221 farmer borrowers was selected by using the random sampling technique. The results of repayment performance of credit indicated that only 81.27 % of short-term credit, 84.34 % of medium-term credit and 77.82 % of long-term bank credit was repaid by due date and the remaining amount was overdue as on due date. The repayment performance of co-operative credit for rabi season was 92.62 % and that for kharif season was 95.44 %. It was higher as compared to banks. The results also indicated that out of 221 farmer borrowers, 124 (56.11 %) were non-defaulters and 97 (43.89 per cent) were defaulters. The percentage defaulters among the farmer borrowers ranged from as high as 61.11 % in the large farmer borrowers to as low as 36.36 % in the marginal farmer borrowers. The regression results revealed that out of eleven explanatory variables only seven variables significantly affected the overdues of defaulters, however, their degrees and numbers varied from category to category. Out of these significant variables, four variables viz., amount borrowed, amount put to un-productive purposes, expenditures on family consumption and old debts were positively and the remaining three variables viz., gross farm income, non-farm income and cropping intensity negatively influenced the overdues.

Keywords: Diversion, repayment, regression, defaulters, explanatory variables, un-productive.

Despite the sharp rise in the major sectors of economy, the agriculture sector is still the single biggest sector contributes about 14 % to the GDP and employing nearly 60 percent of its workforce of our country.But, the significant contribution of some other factors such as irrigation facilities, labour, fertilizers & pesticides, seeds, etc. to the growth of agriculture is compulsory. For acquiring the required inputs, farmer needs credit as his financial sustainability.The agricultural credit includes the amount of loans disbursed in cash and kind to the farmer borrowers for fulfills their farm requirements. In India, a multi-agency approach consisting of Commercial Banks (CBs), Regional Rural Banks (RRBs) and Co-operatives has been followed for disbursing credit to agricultural sector. The institutionalization of agricultural credit is helpful for the farmer borrowers but the problem of overdues is most common for all the financial agencies. It directly affects the refinance ability of the financial institutions because

when the overdue amount increases the loanable amount is blocked, thereby bringing down the steps of agricultural development. So, repayment of credit is of foremost importance to all the financial institutions.Therefore, an attempt was made to explore the different factors that are responsible for creditoverdues and analyzing the repaymentperformance of agricultural credit in the study area.Briefly, this study will beneficial to guide the policy makers for the formulation of future lending policy in agricultural sector.

Methodology

The study examined the repayment performance and factorsaffecting overdues of institutional agricultural credit in Jaipur district of Rajasthan. It was carried out in two panchayatsamitis namely; Govindgarh and Sambhar Lake out of the thirteen panchayatsamitis of the district. From each panchayatsamiti, two gram panchayats were selected at random and all the villages falling within the selected gram panchayatschosen for further investigation.In order to select the farmer borrowers, a list of all the institutional farmer borrowers along with the advances made to them was taken from the records of all the financial agencies falling within the study area. The farmer borrowers categorized into five standard categories on the basis of their size of holdings and 15 % farmer borrowers were selected at random from each category as per probability proportion. The sample strength was 221 which consisted of 55 marginal, 51 small, 45 semi-medium, 52 medium and 18 large farmer. The secondary data relating to credit repayment and its overdues were collected from the records maintained by the concerned financial institutions in the study area. The data were statistically tabulated and analyzed by calculating simple percentages and averages to arrive at the objective specific results. The payable amount of loan, unpaid upto due date was considered as the amount of overdue. It was calculated with help of the following method.

$$\begin{aligned}\text{Overdues} = \{&(\text{Amount to be paid during the year} \\ &+ \text{Amount overdue at the beginning of the year}) \\ &- \text{Amount actually paid during the year}\}\end{aligned}$$

The extent of overdues was measured as the ratio of amount overdue to the amount of loan due for repayment and was expressed in terms of percentage. The extent of overdues was calculated as:

$$\text{Extent of overdues} = \frac{\text{Amount overdue}}{\text{Amount due for repayment}} \times 100$$

The total amount of loan due for repayment included the principal amount and the interest accrued thereon. The repayment performance of the farmer borrowers was measured in terms of percentage of amount repaid to the amount due for repayment in the given period. The repayment performance was calculated with help of the given formula.

$$\text{Repayment performance} = \frac{\text{Amount repaid}}{\text{Amount due for repayment}} \times 100$$

The factors affecting overdues of the defaulter farmer borrowers in the study area were identified by regressing overdues on the following explanatory variables:

Functional relationship: $Y = f(X_1, X_2, X_3, \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots X_{11},)$

Where,

Y = overdues (₹)

x_1 = gross farm income (₹)

x_2 = non-farm income (₹)

x_3 = amount borrowed (₹)

x_4 = cropping intensity (%)

x_5 = repayment capacity (₹)

x_6 = amount put to productive purposes (₹)

x_7 = amount put to unproductive purposes (₹)

x_8 = expenditures on family consumption (₹)

x_9 = farm expenses(₹)

x_{10} = total land holding (ha), and

x_{11} = Old debts (₹)

Both linear and log-linear forms of the multiple regression function as shown below were fitted to the data using the Ordinary Least Squares (OLS) technique.

(i) Multiple linear regression equation:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + \ldots\ldots\ldots\ldots + b_{11} X_{11} + U$$

(ii) Multiple log-linear (Cobb-Douglas) regression equation:

$$Y = a\, X_1^{b1}\, X_2^{b2}\, X_3^{b3} \ldots\ldots\ldots\ldots\ldots\ldots X_{11}^{b11}\, 10^{U}$$

This on log transformation takes the followingform:

$$\text{Log } Y = \text{Long } a + b_1 \text{ Log } X_1 + b_2 \text{ Log } X_2 + \ldots\ldots\ldots\ldots\ldots + b_{11} \text{ Log } x_{11} + U$$

The magnitude of multicollinearity was analyzed by considering the size of the VIF (b_i). A common rule of thumb followed was that if VIF (b_i) > 10 then, it was taken to near high multicollinearity (Kutner, 2004).The regression results exhibited the problem of multicollinearity among the explanatory variables. Therefore, for deciding on the best set of explanatory variables for the regression model stepwise forward regression method was used. The decision to add a variable was made on the basis of the contribution of that variable to the Error Sum of Squares (ESS) as judged by the 'F' test. Significance of regression coefficients were tested on the basis of two tailed student's 't' test. Elasticity coefficients

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were also computed to know the percent change in the overdues due to one percent change in respective explanatory variable. as the number of defaulters in the large farmer borrowers' category was not sufficient enough to run the regression analysis, this category was merged with medium category to form 'medium cum large category' for capturing its effect. Pooled analysis was also attempted to identify the causal factors of overdues in the study area at the aggregate level.

Results and Discussion

(A) Repayment performance and extent of overdues of bank credit

(i) Short-term bank credit: The repayment performance and extent of overdues of short-term bank credit are illustrated in Table 1. It is obvious from the table that the short-term credit repayable to the banks was ₹ 11,355. Out of which ₹ 9,178 (81.27 %) was repaid by repayable date and the remaining ₹ 2,177 (18.73 %) stood as overdues. The per farm due amount was varied from ₹ 6,191 on marginal farms to ₹ 21,666 on large sixed farms. the percentage of repaid amount to repayable amount was highest (91.58 %) on marginal farms followed by 89.59 % on small, 88.43 % on semi-medium, 76.12 % on medium and 73.10 % on large sized farms.Obviously, the extent of overdues was varied from 8.42 % to 26.90 % on marginal to large sized farms.It was positively associated with the increase in the size of holdings.

Table 1: Disbursement, repayment and overdues of short-term credit
(In rupees)

Size groups	Amount							
	Borrowed		Repayable		Repaid		Overdue	
	per farm	per hectare	per farm	per hectare	per farm	per hectare	per farm	per hectare
Marginal	5774	11104	6191(100.00)	11906	5670(91.58)	10904	521(8.42)	1002
Small	6503	4516	6995(100.00)	4858	6267(89.59)	4352	728(10.41)	506
Semi-medium	6727	2288	7266(100.00)	2471	6425(88.43)	2185	841(11.57)	286
Medium	19604	3741	21062(100.00)	4019	16032(76.12)	3059	5030(23.88)	960
Large	19892	1789	21666(100.00)	1948	15838(73.10)	1424	5828(26.90)	524
Overall	10540	3294	11355(100.00)	3548	9228(81.27)	2884	2127(18.73)	664

Figures in parentheses are the percentages to the total

the per hectare average amount of short-term credit repayable by due date was worked out as ₹ 11,906 for marginal, ₹ 4,858 for small, ₹ 2,471 semi-medium, ₹ 4,019 for medium and ₹ 1,948 for large farmer borrowers. The highest amount (₹ 10,904) repaid by the marginal former borrowersfollowed by small, medium, semi-medium and large farmer borrowers. The share of overdues was found to be highest (₹ 1,002) for marginal farmer borrowers and lowest (₹ 286) for the semi-medium farmer borrowers.

(ii) medium-term bank credit: The information with regard to per farm amount repayable, repaid and overdues of medium-term bank credit by the due date and its repayment performance are presented in table 2. It is clear from the table that the per farm repayable amount as on 30.06.2008 was

₹ 13,123. Out of which, 83.34 % (₹ 10,937) was repaid by the due date and the remaining 16.66 % (₹ 2,186) stood as overdues. The amount repayable was highest (₹ 23,658) for large sized farmer borrowers followed by medium, semi-medium, marginal and small farmer borrowers. The repayment performance was found to be highest (91.87 %) for marginal farmers followed by small, semi-medium, medium and large farmer borrowers.

Table 2: Disbursement, repayment and overdues medium-term bank credit

(in ₹)

Size groups	Amount							
	Borrowed		Repayable (as on 30.6.08)		Repaid (up to 30.6.08)		Overdue (as on 30.6.08)	
	per farm	per hectare	per farm	per hectare	per farm	per hectare	per farm	per hectare
Marginal	9189	17671	9608(100.00)	18477	8827(91.87)	16975	781(8.13)	1502
Small	12699	8819	9533(100.00)	6620	8291(86.97)	5758	1242(13.03)	862
Semi-medium	14373	4889	11069(100.00)	3765	9027(81.55)	3070	2042(18.45)	695
Medium	30020	5729	18492(100.00)	3529	14982(81.02)	2859	3510(18.98)	670
Large	38164	3432	23658(100.00)	2127	17971(75.96)	1616	5687(24.04)	511
Overall	18316	5724	13123(100.00)	4101	10937(83.34)	3418	2186(16.66)	683

Figures in parentheses are the percentages to the total

On the hand, the respective extent of overdues for such farmers was estimated at 8.13 %, 13.03 %, 18.45 %, 18.98% and 24.04%. It was noted to be positively associated with increase in the size of holdings.The per hectare overdue amount of medium term credit was highest for marginal farmer borrowers (₹ 1,502) followed by small farmers (₹ 862), semi-medium farmers (₹ 695), medium farmer (₹ 670) and large farmer borrowers (₹ 511). The repayable, repaid and overdue amount were inversely related to the size of holdings.

(iii) long-term bank credit: The repayment performance together with extent of overdues of long-term bank credit is presented in table 3. It is obvious from the table that the repayable amount of long-term bank credit was ₹ 34,541. Out of which, 77.82 % (₹ 26,879) was repaid by the due date and the remaining 22.18 % (₹ 7,662) stood as overdues. The per farm repayable amount was ranged from ₹ 15,605 to ₹ 1,0,3751 on marginal to large farmer borrowers. On the other hand, the repaid amount was varied from ₹ 13,392 by small farmer borrowers to ₹ 76,902 large farmer borrowers. The extent of overdues was 14.18%, 21.14 %, 22.59% and 25.88% to small, semi-medium medium and large farmer borrowers, respectively. The average per hectare repayable amount of long-term credit was observed to be highest (₹ 13,381) for semi-medium farmer borrowers followed by medium (₹ 11,743), small (₹10, 837) and large (₹ 9,330) farmer borrowers.

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Table 3: Disbursement, repayment and overdues long-term bank credit

(in ₹)

Size groups	Amount							
	Borrowed		Repayable (as on 30.6.08)		Repaid (up to 30.6.08)		Overdue (as on 30.6.08)	
	per farm	per hectare	per farm	per hectare	per farm	per hectare	per farm	per hectare
Marginal	-	-	-	-	-	-	-	-
Small	22655	15732	15605(100.00)	10837	13392(85.82)	9300	2213(14.18)	1537
Semi-medium	67723	23035	39341(100.00)	13381	31025(78.86)	10553	8316(21.14)	2828
Medium	109251	20850	61536(100.00)	11743	47632(77.41)	9090	13904(22.59)	2653
Large	184999	16636	103751(100.00)	9330	76902(74.12)	6916	26849(25.88)	2414
Overall	59792	18685	34541(100.00)	10794	26879(77.82)	8400	7662(22.18)	2394

Figures in parentheses are the percentages to the total

On the other hand, the repaid amount was found to be highest for semi-medium farmer borrowersand lowest for large farmer borrowers.

(B) Repayment performance and extent of overdues of co-operative credit

(i) *Rabi* season co-operative credit: The overall co-operative credit repayable by the farmers as on May 31, 2006 in *rabi* season was ₹ 8,892. Out of which 92.62 % was repaid in time and the remaining 7.38 % was overdue (Table 4). The per farm average dues was varied from ₹ 7,267 to ₹ 10,375 for marginal to large farmer borrowers.the repayment performance was assessed as 93.45 % for marginal, 93.12 % for small, 92.52 % for semi-medium, 92.32 % for medium and 90.81 % for large farmer borrowers. It was increased with the increase in the size of holdings. On the other hand, the extent of overdues for the same farmer borrowers was calculated as 6.55 %, 6.88 %, 7.48 %, 7.68 % and 9.19 % in that order. The extent of overdues during the season increased with the increase in the size of holdings. The per hectare amount repayable, repaid and overdue were inversely related to the size of holdings.

Table 4: Disbursement, repayment and overdues short-term co-operative credit

(in ₹)

Size groups	Amount (*Rabi* season)							
	Borrowed		Repayable as on May 31, 2006		Repaid upto May 31, 2006		Overdue as on June 1, 2006	
	per farm	per hectare	per farm	per hectare	per farm	per hectare	per farm	per hectare
Marginal	7011	13482	7267(100.00)	13975	6791(93.45)	13060	476(6.55)	915
Small	8180	5680	8475(100.00)	5885	7892(93.12)	5480	583(6.88)	405
Semi-medium	9119	3102	9482(100.00)	3225	8773(92.52)	2984	709(7.48)	241
Medium	9537	1820	9995(100.00)	1907	9227(92.32)	1761	768(7.68)	146
Large	9912	891	10375(100.00)	933	9422(90.81)	847	953(9.19)	86
Overall	8541	2669	8892(100.00)	2779	8236(92.62)	2574	656(7.38)	205

Figures in parentheses are the percentages to the total

***Kharif* season co-operative credit:** the details about the average per farm amount repayable, repaid and overdue of *kharif* season co-operative credit and its repayment performance with extent of overdues are presented in table 5. The table shows that the average co-operative credit repayable as on Feb. 28, 2007 in *kharif* season was ₹ 9,440. Out of this, 95.44 % (₹ 9,009) was repaid in time and the remaining 4.56 % (₹ 431) was overdue. The amount repaid as percentage of repayable amount was observed more or less same for all the size groups. Similarly, no any particular trend was observed in extent of overdues. The per hectare amount repayable, repaid and overdue decreased with increase in the size of holding. The extent of overdues in *Rabi* season was higher (7.38 %) as compared to the *kharif* season (4.56 %) because of more farm income from crop production during *kharif*season.The farm income from crop production was higher in *kharif*season because the overall total cropped area was highest (49.20) % in *kharif*season as compared to *rabi*season (44.21 %) and *zaid*season (6.22 %).

Table 5: Disbursement, repayment and overdues short-term co-operative credit

(in ₹)

Size groups	Amount (*Kharif* season)							
	Borrowed		Repayable as on Feb. 28, 2007		Repaid upto Feb. 28, 2007		Overdue as on March 1, 2007	
	per farm	per hectare	per farm	per hectare	per farm	per hectare	per farm	per hectare
Marginal	7257	13956	7534(100.00)	14488	7161(95.05)	13771	373(4.95)	717
Small	8250	5729	8601(100.00)	5973	8189(95.21)	5687	412(4.79)	286
Semi-medium	10026	3410	10406(100.00)	3539	9991(96.01)	3398	415(3.99)	141
Medium	10301	1966	10767(100.00)	2055	10272(95.40)	1960	495(4.60)	95
Large	10988	988	11396(100.00)	1025	10873(95.41)	978	523(4.59)	47
Overall	9070	2834	9440(100.00)	2950	9009(95.44)	2815	431(4.56)	135

Figures in parentheses are the percentages to the total

Table 6 revealed that out of 221 farmer borrowers, 124 (56.11 %) were non-defaulters and 97 (43.89 %) was defaulters.

Table 6: Category-wise defaulter farmer borrowers

Size groups	Total number of defaulters	Total number of non-defaulters	Total number of borrowers
Marginal	20(36.36)	35(63.64)	55(100.00)
Small	21(41.18)	30(58.82)	51(100.00)
Semi-medium	19(42.22)	26(27.78)	45(100.00)
Medium	26(50.00)	26(50.00)	52(100.00)
Large	11(61.11)	7(38.89)	18(100.00)
All total	97(43.89)	124(56.11)	221(100.00)

Figures in parenthesis are the percentages to the total

The percentage defaulters among the farmer borrowers ranged from as high as 61.11 % in the large farmer borrowers to as low as 36.36 % in the marginal farmer borrowers. The percentage of defaulters increased with the increase in the size of holdings. It might be attributed to be increase in the diversion of un-productive loan amount with increase the size of land holdings.

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(C) Factors affecting overdues of institutional agricultural credit

The linear regression results finally obtained and considered for discussion on the basis of stepwise regression method are presented in Table 7. In respect of marginal farmer defaulters, the regression results revealed that the coefficient of non-farm income (X_2 = -0.12) was significantly negative at 5 %level of significance. It may be attributed to the fact that with the increase in level of non-farm income, the farmers would be able to repay the borrowed loan easily. The coefficient of old debts (X_{11} = 0.18) was significantly positive at 1 % level of significance. It means the overdues increased with increase in the amount of old debts because the already indebted farmer defaulters were unable to repay the amount of institutional loans in stipulated time period. These two explanatory variables together accounted for 84.48 % variation in the overdues. The elasticity coefficients indicated that 1% increase in non-farm income decreased the overdues by 0.86 % and 1 % increase in old debts increased the overdues by 2.52 %.

In relation to small farmer, the regression coefficient for amount put to unproductive purposes (X_7 = 0.27) was significantly positive at 1 % level of significance. This was due to the fact that the amount of loan put to un-productive purposes reduced the amount of loan meant for productive purposes thereby resulting into low income to repay the loan. Similarly, the regression coefficient for old debts (X_{11} = 0.21) was also significantly positive at 10 % level of significance indicating that larger the amount of old debts, higher was the amount of overdues because higher amount of old debts had adverse impact on the availability of funds for repaying the loan. The coefficient of determination (R^2) was 0.8610 indicating that 86.10 % of variation in overdues was explained by the explanatory variables included in the model. The elasticity coefficients indicated that one percent increase in amount put to un-productive purposes increased the overdues by 1.45 % and 1 % increase in old debts increased the overdues by 0.31 %.

Among all the explanatory variables, only three explanatory variables significantly affected the overdues of semi-medium farmer defaulters. The regression coefficients of the selected three explanatory variables, *i.e.*, gross farm income (X_1 = -0.01), amount borrowed (X_3 = 0.15) and amount put to un-productive purposes (X_7 = 0.25) were found to be statistically significant at 10 %level of significance. Out of these, amount borrowed (X_3) and amount put to un-productive purposes (X_7) had significantly positive relationship while gross farm income (X_1) had significantly negative relationship with the amount of overdues. These three explanatory variables together accounted for 94.55 % of the variation in overdues. The elasticity coefficients indicated that one per cent increase in gross farm income decreased the overdues by 1.26 % and one per cent increase in each of amount borrowed and amount put to un-productive purposes increased the overdues by 2.35 % and 1.17 % in that order.

The regression results revealed that only four explanatory variables namely; gross farm income (X_1), amount borrowed (X_3), expenditures on family consumption (X_8) and old debts (X_{11}) significantly affected the overdues of medium cum large category of farmer defaulters. The regression coefficient of gross farm income (X_1 = -0.07) was estimated to be negative and significant at 5 % level of significance. And, on the other hand, that of amount borrowed (X_3 = 0.10) and old debts (X_{11} = 0.50) were positive and significant at 1 % level of significance. expenditures on family consumption (X_8 = 0.10), too, was positive and significant but at 10 % level of significance. The coefficient of determination (R^2) was 0.7851 indicating that 78.51 % of variation in overdues was explained by the explanatory

variables included in the model. The elasticity coefficients indicated that 1 % increase in gross farm income decreased the overdues by 2.74 %. On the contrary, 1 % increase in each of amount borrowed, expenditures on family consumption and old debts increased the overdues by 3.04%, 0.66% and 0.62 %, respectively.

Table 7: Estimated multiple linear production function for the farmer defaulters

S.No.	Explanatory variables / Size groups	Regression coefficients	Standard Error	VIF	Elasticity coefficients
Marginal farmer defaulters (R^2=.84)					
1.	Intercept (a)	4868.16	1258.59	-	-
2.	Non-farm income (X_2)	-0.12**	0.04	1.13	-0.86
3.	Old debts (X_{11})	0.18***	0.03	1.13	2.52
Small farmer defaulters (R^2=.86)					
1.	Intercept (a)	4709.16	2694.35	-	-
2.	Amount put to un-productive purposes (X_7)	0.27***	0.04	1.44	1.45
3.	Old debts (X_{11})	0.21*	0.09	1.44	0.31
Semi-medium farmer defaulters (R^2=.95)					
1.	Intercept (a)	15191.96	10816.22	-	-
2.	Gross farm income (X_1)	-0.01*	0.05	1.07	-1.26
3.	Amount borrowed (X_3)	0.15*	0.05	7.27	2.35
4.	Amount put to un- productive purposes (X_7)	0.25*	0.09	7.34	1.17
Medium farmer defaulters (R^2=.76)					
1.	Intercept (a)	12635.04	11439.72	-	-
2.	Amount borrowed (X_3)	0.08**	0.02	1.38	2.65
3.	Cropping intensity (X_5)	-0.31*	0.14	1.12	-0.42
4.	Old debts (X_{11})	0.48**	0.13	1.37	0.58
Medium cum large farmer defaulters (R^2=.79)					
1.	Intercept (a)	1909.35	7678.31	-	-
2.	Gross farm income (X_1)	-0.07**	0.02	1.35	-2.74
3.	Amount borrowed (X_3)	0.10***	0.02	1.60	3.04
4.	Expenditures on family consumption (X_8)	0.10*	0.05	1.54	0.66
5.	Old debts (X_{11})	0.50***	0.11	1.59	0.62
Aggregate / pooled farmer defaulters (R^2=.81)					
1.	Intercept (a)	-3129.46	2517.79	-	-
2.	Gross farm income (X_1)	-0.05***	0.01	1.91	-2.58
3.	Amount borrowed (X_3)	0.13***	0.01	2.07	3.87
4.	Expenditures on family consumption (X_8)	0.10**	0.04	1.93	0.66
5.	Old debts (X_{11})	0.33***	0.06	1.73	0.56

*** significant at 1 % level of significance

** significant at 5 % level of significance

* significant at 10% level of significance

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The regression results for aggregate or pooled farmer defaulters indicated that the gross farm income (X_1= -0.05), amount borrowed (X_3 = 0.13), expenditures on family consumption (X_8 = 0.10) and old debts (X_{11} = 0.33) had significant influence on the amount of overdues. The results indicated that the gross farm income (X_1) was significantly negative at 1 % level of significance. amount borrowed (X_3) and old debts (X_{11}) were significantly positive at 1% level of significance and expenditures on family consumption (X_8) was also significantly positive at 5 %level of significance. These four explanatory variables together accounted for 81.15 % of variation in overdues. The elasticity coefficients showed that 1 % increase in gross farm income decreased the overdues by 2.58 % and 1 % increase each in the amount borrowed, expenditures on family consumption and old debts increased the overdues by 3.87, 0.66 and 0.56 %, respectively.

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