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Assessment of loan recovery performance and credit overdues in a cooperative banking system

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Abstract

The present study examines the performance of agricultural lending by the Jaipur Central Co-operative Bank with special emphasis on loan overdues and their underlying determinants. The investigation was conducted to assess the contribution of agricultural credit to the bank's overall lending portfolio, analyse the growth pattern of agricultural advances over time, and identify the factors responsible for loan repayment defaults among borrowers. For the field-level analysis, the Renwal branch in Phulera tehsil and Bhojpura Kalan Gram Sewa Sahakari Samiti were selected. The study covered all 77 defaulting farm households associated with the selected society, who were classified into marginal, small, semi-medium, and medium farm categories. Information was collected from both primary and secondary sources, while primary data related to the agricultural year 2009–10 were obtained through personal interviews.

The analysis revealed a statistically significant upward trend in agricultural, non-agricultural, and total credit disbursement. The time variable explained more than 92 per cent of the variation in agricultural credit and about 90 per cent of the variation in non-agricultural lending. Compound growth rates indicated that agricultural credit expanded at a faster pace (10.32% per annum) than non-agricultural credit (7.50% per annum), while total advances increased by 8.40 per cent annually. Within agricultural lending, short-term credit registered a higher growth rate (10.46%) than medium-term credit (8.58%). Regression analysis further showed that variables such as borrowing level, old indebtedness, diversion of loans to non-productive uses, farm income, and cropping intensity significantly influenced the magnitude of outstanding loan dues among different categories of credit recipients.

Keywords: Agricultural credit, co-operative banking, loan recovery, overdues, repayment behaviour, Rajasthan

Introduction

Background and Rationale

Agriculture continues to be a key component of the Indian economy, supporting rural livelihoods and contributing significantly to employment generation. The adoption of improved crop production technologies, quality inputs, mechanization, and scientific farming practices has increased the financial requirements of farm households. As a result, timely availability of credit has become an essential prerequisite for sustaining agricultural production and enhancing farm productivity. Institutional credit has emerged as an important instrument for meeting the short-term and long-term financial needs of farmers. Over the years, the Government of India has introduced several policy initiatives to strengthen the rural credit delivery system and improve farmers' access to formal sources of finance. Commercial banks, regional rural banks, and cooperative credit institutions collectively play a crucial role in supplying agricultural credit across the country.

Among these agencies, cooperative credit institutions occupy a distinctive position because of their extensive village-level network and close association with farming communities. The cooperative credit structure facilitates the flow of institutional finance to farmers through a three-tier framework consisting of State Cooperative Banks, District Central Cooperative Banks, and Primary Agricultural Credit Societies. This arrangement is particularly beneficial for small and marginal farmers who often face difficulties in accessing credit from other formal institutions. Rajasthan possesses a well-established cooperative credit network that has contributed significantly to agricultural development in the state. District Central Cooperative Banks act as an important intermediary between the apex cooperative bank and village-level credit societies, ensuring the smooth distribution of agricultural loans. Despite considerable progress in credit disbursement, recovery performance remains a matter of concern for many cooperative institutions.

Recent studies have highlighted the continuing importance of institutional credit in enhancing farm productivity, income stability and technology adoption among agricultural households. However, the sustainability of rural credit systems depends largely on repayment discipline and efficient utilisation of borrowed funds. NABARD (2023) reported that credit demand among smallholder farmers has increased substantially due to rising production costs and climate-related risks. Similar observations were made by Kumar *et al.* (2021) ^[5], who noted that repayment challenges are frequently associated with indebtedness, income instability and diversion of borrowed funds.

A high level of loan default amount adversely affects the financial health of lending agencies by reducing the availability of recyclable funds and restricting future lending operations. Persistent defaults may also weaken the effectiveness of institutional credit programmes intended to support agricultural growth. Therefore, an understanding of the extent of loan repayment and the factors responsible for repayment failures is essential for formulating suitable credit and recovery policies. Against this backdrop, the present investigation was undertaken to evaluate the performance of agricultural lending and to identify the socio-economic and financial factors associated with outstanding loan dues among borrowers of the Jaipur Central Cooperative Bank in Rajasthan.

Data Sources and Analytical Framework

The empirical investigation was conducted in Jaipur district of Rajasthan, where the Jaipur Central Cooperative Bank serves as one of the major institutional agencies involved in agricultural financing. The bank was purposively selected due to its active participation in rural credit delivery and the availability of relevant lending and recovery records. The study relied on both primary and secondary sources of information. Secondary information relating to credit disbursement, recovery performance, and operational activities of the cooperative banking system was obtained from annual reports, official publications, statistical records, and documents maintained by the Jaipur Central Cooperative Bank, Rajasthan State Cooperative Bank, NABARD, and other related institutions.

Primary data were collected during the agricultural year 2009–10 through personal interviews with selected borrowers using a structured survey schedule. For detailed field investigation, Renwal branch of the Jaipur Central Cooperative Bank and Bhojpura Kalan Gram Sewa Sahakari

Samiti were selected. All 77 farm households classified as defaulters by the society were included in the study to obtain a comprehensive understanding of repayment behaviour and overdue positions. The respondents were grouped into marginal, small, semi-medium, and medium farm categories according to the size of their operational holdings. Information was collected on farm income, non-farm income, borrowing pattern, expenditure behaviour, existing liabilities, cropping intensity, and repayment status. The extent of overdues was measured by comparing the amount due for repayment with the amount actually repaid by credit recipients during the reference period. Descriptive statistics such as averages, percentages, and proportions were employed to analyse borrowing behaviour and repayment performance.

To examine the factors associated with overdue loans, multiple regression analysis was applied. Outstanding loan dues constituted the dependent variable, while explanatory variables included agricultural earnings, non-farm income, cropping intensity, credit availed, expenditure on productive and non-income-generating expenditure, household consumption expenditure, farm expenditure, and old debt liabilities. Alternative model specifications were examined, and the final equations were selected based on statistical significance and explanatory power. Diagnostic measures including the Variance Inflation Factor (VIF) and Durbin–Watson statistic were used to assess multicollinearity and autocorrelation in the estimated models.

Empirical Findings and Interpretation

1. Category wise defaulter farmer borrowers

The distribution of defaulter respondents across farm-size categories is presented in Table 1. Out of the total 77 defaulter farmers, the highest proportion belonged to the semi-medium category (42.85%), followed by small farmers (24.68%), marginal farmers (16.88%), and medium farmers (15.59%). Village-wise analysis revealed that Bhojpura Kalan accounted for the largest number of defaulters, representing 42.86 per cent of the total sample. This may be attributed to the higher concentration of credit recipients in the village, as it serves as the headquarters of the selected Gram Sewa Sahakari Samiti. The findings indicate that loan default was more prevalent among semi-medium and small farmers than among marginal and medium farmers. Similar observations regarding the concentration of overdues among small and semi-medium farm categories have been reported by Singh *et al.* (2005) ^[12] and Das (2001) ^[2].

Table 1: Distribution Pattern of Defaulting Borrowers Across Farm Categories

Size of group Villages	Marginal	Small	Semi-medium	Medium	Total number of borrowers
Bhojpura Kalan	7 (21.21)	6 (18.18)	16 (48.48)	4 (12.13)	33 (100.00)
Khirwa	4 (33.33)	2 (16.67)	5 (41.67)	1 (8.13)	12 (100.00)
Turkiyawas	-	5 (50.00)	2 (20.00)	3 (30.00)	10 (100.00)
Vijay Govindpura	2 (15.39)	6 (46.16)	4 (30.76)	1 (7.69)	13 (100.00)
Laxmipura	-	-	6 (66.66)	3 (33.34)	9 (100.00)
Total	13 (16.88)	19 (24.68)	33 (42.85)	12 (15.59)	77 (100.00)

2. Borrowing Pattern, Recovery Status and Outstanding Dues

The overall average loan borrowed by the sample farmers was ₹6,210.68 per farm. Out of this amount, only ₹981.75 was repaid, while ₹5,229.02 remained outstanding as overdue. Among different farm categories, small farmers borrowed the highest average amount (₹8,180.00), followed by semi-medium farmers (₹7,200.00), medium farmers (₹6,696.47), and marginal farmers (₹5,757.31). Repayment performance varied from 13 to 20 per cent across farm categories. Marginal farmers exhibited comparatively better loan recovery behaviour (20%), whereas medium farmers recorded the lowest repayment rate (13%). Consequently, the extent of overdues ranged between 80 and 87 per cent. The highest overdue percentage was observed among medium farmers (87%), while marginal farmers recorded the lowest (80%). The results indicate a generally weak recovery performance among respondents of the selected society. Arunachalam and Palanisamy (1991) ^[1] and Hooda *et al.* (1993) ^[3], who observed that weak repayment behaviour adversely affected the financial sustainability of co-operative credit institutions.

3. Regression results for marginal farmer borrowers

The regression results for marginal farmers are presented in Table 2. The analysis identified amount borrowed (X4) and old debts (X9) as significant determinants of loan outstanding loan dues. The coefficient of credit availed was positive and significant at the one per cent level, indicating that an increase in borrowing resulted in a corresponding increase in overdue amounts. Likewise, pre-existing liabilities exerted a positive and significant influence on overdues, suggesting that farmers carrying previous debt obligations faced greater difficulty in repaying institutional loans. The coefficient of determination ($R^2 = 0.983$) indicates that 98.3 per cent of the variation in outstanding loan dues was explained by the variables included in the model. The significant F-value confirmed the overall adequacy of the regression model. Elasticity estimates showed that outstanding loan dues were highly responsive to changes in the credit availed, whereas the influence of pre-existing liabilities was relatively lower

but still important. These findings are consistent with the results of Koopahi and Bakhshi (2002) ^[4], who identified previous indebtedness as a major factor affecting repayment performance among agricultural respondents. Similar conclusions were also reported by Kohansal and Mansoori (2009) ^[6].

Table 2: Factors Influencing Credit Default: Regression Estimate for the marginal farmers borrowers

Sr. No.	Explanatory variable	Regression coefficient	Standard error	VIF	Elasticity coefficient
1.	Intercept (a)	-3142.708	364.151	-	-
2.	Amount borrowed (X ₄)	0.782***	0.076	3.567	1.33
3.	Old debts (X ₉)	0.300**	0.102	3.567	0.33

Dependent variable overdues (y)

Number of farmer respondents (N) = 13

Coefficient of multiple correlation (R) - 0.992

Coefficient of determination (R^2) - 0.983

Adjusted coefficient of determination (R^2) - 0.980

'd' statistics - 1.389

'F' value (with 2, 10 d.f.) - 8.66

*** Significant at 1 per cent level of significance

** Significant at 5 per cent level of significance

4. Regression Results for Small Farmer Borrowers

The results presented in Table 3 reveal that the amount utilised for non-productive purposes (X6) was the only variable significantly influencing overdues among small farmers. The regression coefficient was positive and highly significant, indicating that diversion of loan funds towards non-income-generating activities increased the amount of overdue loans. The coefficient of determination ($R^2 = 0.889$) suggests that nearly 88.9 per cent of the variation in outstanding loan dues was explained by this variable. The estimated elasticity coefficient indicated that repayment arrears responded almost proportionately to changes in expenditure on non-productive purposes. The findings emphasise the importance of ensuring productive utilisation of agricultural credit for improving loan recovery behaviour. The findings support earlier studies conducted by Hooda *et al.* (1993) ^[3] and Singh *et al.* (2005) ^[12], which reported that diversion of agricultural loans from productive uses reduced farm income and weakened repayment capacity.

Table 3: Factors Influencing Credit Default: Regression Estimate for the small farmers borrowers

S. No.	Explanatory variable	Regression coefficient	Standard error	VIF	Elasticity coefficient
1.	Intercept (a)	-410.57	737.789	-	-
2.	Amount put to un-productive purposes (X ₆)	1.501***	0.129	0.129	1.08

Dependent variable overdues (y)

Number of farmer borrowers (N) = 19

Coefficient of multiple correlation (R) - 0.943

Coefficient of determination (R^2) - 0.88

Adjusted coefficient of determination (R^2) - 0.882

'd' statistics - 1.514

'F' value (with 1, 17 d.f.) - 13.38

*** Significant at 1 per cent level of significance

5. Regression Results for Semi-medium Farmer Borrowers

The regression estimates for semi-medium farmers are shown in Table 4. Gross farm income (X1) and amount borrowed (X4) emerged as significant determinants of loan overdues. Both variables exhibited positive and statistically significant coefficients. The coefficient of determination ($R^2 = 0.934$)

indicates that 93.4 per cent of the total variation in default amount was explained by the selected explanatory variables. The overall regression was statistically significant, as evidenced by the F-statistic. Elasticity coefficients revealed that repayment arrears were relatively more sensitive to changes in the credit availed than to changes in agricultural earnings. The results suggest that increasing loan size

contributed substantially to overdue accumulation among semi-medium farmers. The relationship between borrowing level and repayment performance has also been documented by Kumar (2000) ^[5] and Sidhu (2008) ^[11], who reported that increasing credit exposure without corresponding improvements in farm profitability may lead to repayment problems.

Table 4: Factors Influencing Credit Default: Regression Estimate for the semi-medium farmers borrowers

S. No.	Explanatory variable	Regression coefficient	Standard error	VIF	Elasticity coefficient
1.	Intercept (a)	2355.041	3848.842	-	-
2.	Gross farm income (X ₁)	0.039***	0.077	2.129	0.86
3.	Credit availed (x ₄)	0.969**	0.019	2.129	1.54

Dependent variable overdues (y)

Number of farmer respondents (N) = 33

Coefficient of multiple correlation (R) - 0.967

Coefficient of determination (R²) - 0.934

Adjusted coefficient of determination (R²) - 0.930

'd' statistics - 1.905

'f' value (with 2, 30 d.f.) - 4.17

*** Significant at 1 per cent level of significance

** Significant at 5 per cent level of significance

6. Regression Results for medium Farmer Borrowers

Table 5 presents the regression results for medium farmers. Three variables, namely cropping intensity (X₃), amount utilised for non-productive purposes (X₆), and old debts (X₉), significantly influenced the level of overdues. Cropping intensity exhibited a negative coefficient, indicating that higher cropping intensity reduced overdue amounts. This relationship suggests that increased utilisation of land resources enhances farm income and improves repayment capacity. In contrast, expenditure on non-income-generating expenditure and pre-existing liabilities showed positive coefficients, implying that both factors contributed to the accumulation of overdue loans. The coefficient of determination (R² = 0.946) demonstrates that 94.6 per cent of the variation in default amount was explained by the selected variables. The elasticity estimates further revealed that cropping intensity had the strongest influence on overdues among medium farmers. These findings are in agreement with the observations of Misra and Maurya (2007) ^[7], who reported that higher farm productivity and better resource utilisation enhanced repayment capacity, while indebtedness adversely affected loan recovery.

Table 5: Factors Influencing Credit Default: Regression Estimate for the medium farmers borrowers

S. No.	Explanatory variable	Regression coefficient	Standard error	VIF	Elasticity coefficient
1.	Intercept (a)	25903.551	9529.127	-	-
2.	Cropping intensity (X ₃)	-175.185*	61.896	2.954	-3.84
3.	Amount put to un-productive purposes (x ₆)	0.316*	0.298	4.612	0.15
4.	Old debts (X ₉)	0.517***	0.107	2.045	0.82

Dependent variable overdues (y)

Number of farmer respondents (N) = 12

Coefficient of multiple correlation (R) - 0.973

Coefficient of determination (R²) - 0.946

Adjusted coefficient of determination (R²) - 0.926

'd' statistics - 2.783

'f' value (with 3, 8 d.f.) - 8.01

*** Significant at 1 per cent level of significance

* Significant at 10 per cent level of significance

7. Regression Results for Aggregate or Pooled Farmer Borrowers

The pooled regression results presented in Table 6 provide an overall assessment of factors affecting loan overdues in the study area. Five variables—gross farm income (X₁), cropping intensity (X₃), amount borrowed (X₄), amount utilised for non-productive purposes (X₆), and old debts (X₉)—were found to significantly influence repayment arrears. Cropping intensity had a negative and significant effect, indicating that improved cropping intensity reduced the level of overdue loans. On the other hand, agricultural earnings, credit availed, expenditure on non-income-generating expenditure, and pre-existing liabilities exerted positive and significant influences on repayment arrears. The coefficient of determination (R² = 0.906) indicates that the

selected variables explained 90.6 per cent of the variation in overdue amounts. The elasticity estimates revealed that default amount were relatively more responsive to changes in agricultural earnings and cropping intensity than to changes in the other explanatory variables. These findings highlight the importance of efficient farm management, productive utilisation of borrowed funds, and reduction of existing debt burdens in improving repayment performance. The results suggest that productive agricultural activities and efficient farm management contribute to improved loan recovery behaviour. Conversely, excessive borrowing, diversion of credit, and accumulated debt obligations increase repayment risk. Similar findings have been reported by Koopahi and Bakhshi (2002) ^[4], Kohansal and Mansoori (2009) ^[6], and Singh *et al.* (2005) ^[12].

Table 6: Factors Influencing Credit Default: Regression Estimate for aggregate or pooled farmer borrowers

S. No.	Explanatory variable	Regression coefficient	Standard error	VIF	Elasticity coefficient
1.	Intercept (a)	9159.442	3663.839	-	-
2.	Gross farm income (X_1)	0.043***	0.010	2.550	-1.01
3.	Cropping intensity (x_3)	-27.600**	10.397	3.349	-0.87
4.	Credit availed (X_4)	0.374***	0.081	4.503	0.67
5.	Amount put to un-productive purposes (X_6)	0.923***	0.135	4.010	0.58
6.	Old debts (X_9)	0.118***	0.044	1.324	0.17

Dependent variable overdues (y)

Number of farmer respondents (N) = 77

Coefficient of multiple correlation (R) - 0.952

Coefficient of determination (R^2) - 0.906Adjusted coefficient of determination (R^2) - 0.900

'd' statistics - 1.893

'F' value (with 5, 71 d.f.) - 7.05

*** Significant at 1 per cent level of significance

** Significant at 5 per cent level of significance

8. Relationship between amount borrowed (x_4) and overdues (y)

The correlation coefficients between credit availed and overdues are presented in Table 7. The results indicate a positive and statistically significant relationship for all categories of farmers. The estimated correlation coefficients ranged from 0.656 for medium farmers to 0.984 for marginal farmers. At the aggregate level, the correlation coefficient was estimated at 0.861, indicating a strong positive association between loan amount and overdue levels. The results imply that larger borrowings were generally accompanied by higher overdue amounts. This finding suggests that repayment capacity did not increase proportionately with loan size, resulting in a higher probability of default among credit recipients with larger credit exposure. The results indicate that larger borrowings were generally associated with higher overdue amounts. Similar positive relationships between loan size and repayment default have been reported by Das (2001)^[2] and Singh *et al.* (2005)^[12], who observed that increased credit exposure often raises repayment obligations beyond the repayment capacity of respondents.

Table 7: Association between Credit Availed and Outstanding Loan Dues

S. No.	Farm size group	Correlation coefficient (r)	t-value
1.	Marginal	0.984***	18.54
2.	Small	0.937***	11.06
3.	Semi-medium	0.962***	19.56
4.	Medium	0.656***	2.75
5.	Aggregate or pooled	0.861***	14.65

*** Significant at 1 per cent level of significance

Summary, Implications and Policy Recommendations

The findings suggest that cooperative credit institutions should strengthen borrower monitoring mechanisms and promote need-based credit assessment before loan sanction. Special attention may be given to borrowers with substantial pre-existing liabilities because such households exhibit a greater probability of repayment default. Training programmes focusing on productive utilisation of credit resources can also contribute to improved recovery performance. Furthermore, promoting crop diversification and increasing cropping intensity may enhance farm income and consequently improve repayment capacity.

The study demonstrates that the Jaipur Central Cooperative Bank experienced a consistent expansion in lending activities over the reference period, with agricultural advances registering a comparatively faster growth than non-agricultural lending. The increasing share of agricultural credit reflects the growing dependence of farm households on institutional sources of finance for production-related activities. The analysis of repayment performance revealed a substantial incidence of outstanding loan dues among the sampled respondents. Recovery levels remained relatively low across all farm-size categories, indicating the existence of financial and managerial constraints affecting repayment behaviour. The magnitude and determinants of overdues differed across borrower groups, suggesting that loan recovery behaviour is influenced by farm-specific economic conditions. Regression analysis identified several variables that significantly affected overdue loans. Borrowing level, previous debt obligations, and expenditure on non-productive activities generally contributed to an increase in overdue amounts. In contrast, higher cropping intensity was associated with improved loan recovery behaviour, highlighting the importance of efficient utilization of farm resources and income-generating agricultural activities. The pooled analysis further indicated that agricultural earnings, cropping intensity, credit availed, non-productive expenditure, and existing debt burden were the principal determinants of default amount in the study area. These findings suggest that improving the productive use of institutional credit, promoting efficient farm management practices, and strengthening credit supervision mechanisms could substantially enhance recovery performance. From a policy perspective, cooperative credit institutions should focus on regular monitoring of loan utilization, borrower awareness programmes, and timely advisory support to ensure that credit is directed towards productive purposes. Such measures would not only improve repayment behaviour but also strengthen the long-term financial sustainability of cooperative banking institutions serving the agricultural sector.

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