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Analyzing non-performing assets in agricultural loans: A case study of India

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Abstract
The main aim of this research paper is to examine non-performing assets in agricultural loans in India. The agricultural sector is a major pillar of the Indian economy, it represents the primary source of livelihood for about 58% of its population. Agricultural loans are very important in order to achieve technological development in agriculture and implicitly to reduce costs and use sustainable strategies. The data sample was collected from 80 lenders (bank managers) and 1167 borrowers of agriculture credit of Dakshina Kannada district in India. The empirical results are relevant and contribute to a better understanding of the impact of non-performing assets in agricultural loans on a sustainable economic growth in India.

Keywords: *Agricultural Loans; Non-Performing Assets; Regional Rural Bank (RRBs); Economic Growth*.

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Introduction

Non-performing assets in agricultural loans is very important, especially in the global economic context. The agricultural sector is essential in India because it represents the primary source of livelihood for about 58% of its population. In other words, the characteristics of this country are very representative in the context of the research topic. Global systemic challenges related to unsustainable economic growth, demographic dynamics, urbanization, disease and pandemics, accelerating climate change and environmental degradation, technological innovation progress, sharp decline of biodiversity, all make it even more difficult to achieve long-term sustainable development. A very important strategy should focus on the absolute decoupling of economic growth from environmental degradation. Lokesha, Hawaldar and Ishwara (2017) suggested that the success of Green Revolution in Indian agriculture is also influenced by the credit support to agricultural sector for purchase of inputs like fertilizers, seeds and required equipments in right time although the productivity and efficiency of this sector depends on the timely availability of funds at reasonable cost. Official statistics provided by India Brand Equity Foundation (2019) revealed that Gross Value Added by agriculture, forestry and fishing is estimated at Rs 18.53 trillion (US$ 271.00 billion) in FY18.

Literature review

Zhou, Chen and Li (2018) highlighted that agricultural SMEs usually experience difficulties obtaining loans from banks when they do not have credit records and their business sizes are small, but when sales are realized, firms receive profit after procurement cost is deducted. Sarma and Pais (2011) argued that lenders impose high interest rates to farmers, blocking them from accessible financing, which contributes to financial exclusion in the agricultural financial market. According to Spulbar and Birau (2019) it is a very important prerequisite for a country, particular an emerging country such as India, to have a viable banking system in order to achieve sustainable economic growth. Moreover, Antle and Diagana (2003) suggested that sustainable agricultural development remains an elusive goal, particularly in many of the poorest regions of the world because difficult access to capital for farmers can be an obstacle to the implementation of sustainable agricultural technologies and practices. Trivedi et al. (2019) investigated the performance of the banking system in India and argued that is a highly diversified sector that includes various public and private banks, both co-operative and non-cooperative. Lokesha and Hawaldar (2019) suggested that the effectiveness of agricultural credit system depends on the utilization of credit funds by the borrowers considering the fact that in India, banks (commercial, cooperative and regional rural banks) are required to find innovative ways of reaching out to farmers, especially small and medium ones in order to improve the performance of agriculture for inclusive growth and poverty reduction.

Kim (2005) provided some useful empirical results for the future credit risk modeling efforts for agricultural loan portfolios, such as : net cash income is a significant leading indicator to default, and the credit risk model should be segmented by commodity and geographical location. Krishnamurthy (2008) conducted a research study on farm credit in India and revealed that there was severe family pressure for the small and medium farmers and in case of large farmers it was reported that low price of the crops had come in their way of repayment, while the low marketable surplus was quoted by small farmers who availed term loans. However, Kundid Novokmet and Marinović

(2016) suggested that solvency issues cannot be resolved on the basis of extra liquidity, whereas liquidity issues can be solved only partially in the case of the solvent banks.

Ahmed Ud-din (2010) examined the priority sector lending by the commercial banks in India and found that there is a 97 per cent variation in the bank financing of agriculture in the study area, which was explained by independent variables like mounting over dues, interest rate, credit-deposit ratio, branch expansion and volume of business, but also found that the value of mounting over dues, credit deposit ratio and branch expansion are positive and statistically significant with the priority sector lending. Rajeev and Mahesh (2010) found that the problem of non performing assets (NPA) has received considerable attention after the liberalisation of the financial sector in India And concluded that the decline in NPA is mainly due to the awareness on the problem of bad loans at the bank level and it remains true that NPA in the priority sector is still higher than that of the non-priority sector. Kaur and Silony (2011) suggested that the recovery procedure of the banks should be strengthened by organizing recovery camps with the support of the local government and concluded that the creation of awareness among beneficiaries about the importance of prompt repayment, fixing recovery targets, regular visits to the borrowers, sending notices to them, taking strict actions in case of default and setting up a separate cell for recovery of priority sector loans were instrumental to reduce NPAs in this sector.

Jain et. al (2012) stated that the stricter regulations on NPA reduced bad loans in the Indian banks which are conscious about default accounts and proper measures are taken when an account has the potential to become NPA considering that the gross NPA percentage on gross advances as well as total assets has declined from 14.3 per cent and 6.3 per cent in 2004 to 5.2 per cent and 2.5 per cent in 2011 respectively. Kumar (2013) empirically demonstrated that cooperative banks discriminate against lower caste borrowers and stated that the majority of the respondents (91.5%) have a repayment obligation of less than Rs.10,000, while it was found that 63.3% made the repayment out of the income of the other members in the family, 12.2% find their own income generated (using the micro-credit) and the income of others in the family as source for repayment and 9.4% made repayment out of their own other income since credit is provided mainly through cooperative and commercial banks.

Research methodology and data analysis

The empirical databases are collected from primary and secondary sources. The empirical framework includes 80 bank managers and 1167 borrowers of agriculture credit of Dakshina Kannada district in India. The subjects were selected for the purpose of conducting the research study. This is the primary data collected for empirical analysis. The bank managers are selected from 50 public sector, 11 private sector, 5 Regional Rural Bank (RRBs) and 14 cooperative banks operating in Dakshina Kannada district in India. A pilot test was run using the lead bank manager (D.K) and five bank managers from three public sector banks, one private sector, one cooperative and one regional rural bank in India in order to verify the validity and applicability of the questionnaires.

The research methodology also includes testing the validity reliability of the questionnaires so Cronbach's alpha was applied in this regard. The results were 0.76 for borrower's questionnaire and 0.834 for lender's questionnaire. The Multi Stage Disproportionate Sampling method has been applied for the purpose of collecting information from both the borrowers and the lenders.

The statistical sample of selected respondents was selected based on the percentage of total borrowers of agricultural credit. Moreover, the statistical sample of selected banks is based on the agricultural credit granted by them. A total of 1,282 questionnaires were distributed personally and all questionnaires were collected. However, there have been certain situations in which few questions were not answered by the respondents. In these cases such unfilled questionnaires were not considered for empirical evidence. Statistically, the response rate was 91%.

Empirical results

Non Performing Assets (NPA) in agriculture credit represent one of the biggest problems in banks in case of all types of credit and it is more in agriculture credit. In this direction, banks have taken enough measures to minimize NPA. In this context, the researcher has formulated hypothesis that, there is significant difference among the different types of banks in management of non performing assets in agriculture credit.

Hypothesis 1 :

H_1-There is a significant difference among different types of banks in the management of non performing assets in the agriculture credit.

Table no. 1 Information on difficulties in recovery of agriculture credit

Difficulties	Type of banks					Test	p value
	Public	Private	Coop	RRB	Total		
Yes	30	7	3	8	48	Fishers exact test	0.991 NS
	60.0%	63.6%	60.0%	57.1%	60.0%		
No	20	4	2	6	32		
	40.0%	36.4%	40.0%	42.9%	40.0%		
Total	**50**	**11**	**5**	**14**	**80**		
	100%	**100%**	**100%**	**100%**	**100%**		

Source: Primary data; *not significant

The effectiveness of agriculture credit depends on the recovery of credit granted by the banks and it is found that 60 per cent of the banks faced difficulties in recovery of agriculture credit. 63.6 per cent of private sector banks, 60 per cent of cooperative and public sector banks and 57.1 per cent of RRBs faced difficulties in recovery of agriculture credit. There is no significant difference among the different types of banks in facing difficulties in agriculture credit system as Fishers exact test $p=0.991>0.05$.

Table no. 2 Kind of difficulties in recovery of agriculture credit

Difficulties	Type of banks					Test	P Value
	Public	Private	Coop	RRB	Total		
Interference of political	2	0	1	0	3	Fishers exact test	0.274 NS
	6.7%	.0%	33.3%	.0%	6.3%		
Debt waiver policy of	25	7	1	8	41		
	83.3%	100.0%	33.3%	100%	85.4%		
Improper refinance	2	0	1	0	3		
	6.7%	.0%	33.3%	.0%	6.3%		
Trade union influence	1	0	0	0	1		
	3.3%				2.1%		
Total	**50**	**11**	**5**	**14**	**80**		
	100%	**100%**	**100%**	**100%**	**100%**		

Source: Primary data

It is found that 85.4 per cent of the banks stated that the debt waiver policy of government, 6.3 per cent of the banks stated that the interference of political leaders and improper refinance facilities and 2.1 per cent of the banks stated that the trade union influence is the difficulty in recovery of agriculture credit. 100 per cent of private sector bank and RRBs, 83.3 per cent of public sector banks and 33.3 per cent of cooperative banks stated that the debt waiver policy of government is the difficulty in recovery of agriculture credit. 33.3 per cent of cooperative banks and 6.7 per cent of public sector banks stated that the interference of political leaders and improper refinance facilities are the difficulties in recovery of agriculture credit. There is no significant difference among the different types of banks in facing difficulties in agriculture credit system as Fishers exact test p=0.274>0.05.

Table no. 3 Actions taken in case of default in repayment of agriculture credit installments

Actions	Type of banks					Test	p value
	Public	Private	Coop	RRB	Total		
Notice	29	10	3	13	55	Fishers exact test	0.011 S
	58.0%	90.9%	60.0%	92.9%	68.8%		
Legal action	1	1	0	0	2		
	2.0%	9.1%	.0%	.0%	2.5%		
Banking norms	20	0	2	1	23		
	40.0%	.0%	40.0%	7.1%	28.8%		
Total	**50**	**11**	**5**	**14**	**80**		
	100%	**100%**	**100%**	**100%**	**100%**		

Source: Primary data; S =significant

Right actions taken by the banks minimize the default in repayment of agriculture credit installments and it is found that 68.8 per cent of the banks served notice, 28.8 per cent of the banks have taken actions as per banking norms and 2.5 per cent of the banks have taken legal action in case of default in repayment of agriculture credit installments. 92.9 per cent of RRBs, 90.9 per cent of private sector banks, 60 per cent of cooperative banks and 58 per cent of public sector banks served notice in case of default in repayment of agriculture credit installments. 40 per cent of public sector and cooperative banks have taken actions as per banking norms in case of default in repayment of agriculture credit installments. There is significant difference in actions taken among the different types of banks in case of default in repayment of agriculture credit installments as Fishers exact test p=0.011<0.05.

Table no. 4 Information on NPA in agriculture credit

NPA	Type of banks					Test	p value
	Public	Private	Coop	RRB	Total		
Yes	31	7	3	9	50	Fishers exact test	0.998 NS
	62.0%	63.6%	60.0%	64.3%	62.5%		
No	19	4	2	5	30		
	38.0%	36.4%	40.0%	35.7%	37.5%		
Total	**50**	**11**	**5**	**14**	**80**		
	100%	**100%**	**100%**	**100%**	**100%**		

Source: Primary data

It is observed that 62.5 per cent of the banks had NPA in agriculture credit. 64.3 per cent of RRBs (Regional Rural Bank), 63.6 per cent of private sector banks, 62 per cent of public sector banks and 60 per cent of cooperative banks had NPA in agriculture credit. There is no significant difference among the different types of banks for NPA in agriculture credit as Fishers exact test p=0.998>0.05.

Table no. 5 Causes of NPA in agriculture credit

Causes	Type of banks					Test	p value
	Public	**Private**	**Coop**	**RRB**	**Total**		
Ignorance of beneficiary	1	0	0	1	2	Fishers exact test	0.134 NS
	3.2%	.0%	.0%	11.1%	4.0%		
Misutilisation of funds	4	0	1	4	9		
	12.9%	.0%	33.3%	44.4%	18.0%		
Lack of knowledge on scientific farming	0	1	0	0	1		
	.0%	14.3%	.0%	.0%	2.0%		
willful default by the borrowers	8	5	1	1	15		
	25.8%	71.4%	33.3%	11.1%	30.0%		
Lack of marketing skills	1	0	0	0	1		
	3.2%	.0%	.0%	.0%	2.0%		
Low equity position	1	0	0	0	1		
	3.2%	.0%	.0%	.0%	2.0%		
Inefficiency of small farm	4	1	0	0	5		
	12.9%	14.3%	.0	.%	10.0%		
Government policies on waivers	12	0	1	3	16		
	38.7%	.0%	33.3%	33.3%	32.0%		
Total	**50**	**11**	**5**	**14**	**80**		
	100%	**100%**	**100%**	**100%**	**100%**		

Source: Primary data

An understanding about the causes of NPA in agriculture credit by the banks helps them in reduction of NPA in future agriculture credit and it is found that 32 per cent of the banks stated that government policies on waivers, 30 per cent of the banks stated that willful default by the borrowers, 18 per cent of the banks stated that misutilisation of funds, 10 per cent of the banks stated that inefficiency of small farm operators, 4 per cent of the banks stated that ignorance of beneficiary and 2 per cent of the banks stated that lack of knowledge about scientific farming, low marketing skills and low equity position of farmers were the causes for NPA in agriculture credit. 71.4 per cent of private sector banks, 33.3 per cent of cooperative banks, 25.8 per cent of public sector banks and 11.1 per cent of regional rural banks stated that the willful default by the borrowers was the cause for NPA in agriculture credit. 38.7 per cent of public sector banks stated that the government policy on waivers was the cause for NPA in agriculture credit. There is no significant difference among the different types of banks on the causes for NPA in agriculture credit as Fishers exact test p=0.134>0.05.

Table no. 6 Information on any special cell for supervision of credit

	Type of banks					Test	p value
	Public	**Private**	**Coop**	**RRB**	**Total**		
Yes	20	5	2	4	31	Fishers exact test	0.839 NS
	40.0%	45.5%	40.0%	28.6%	38.8%		
No	30	6	3	10	49		
	60.0%	54.5%	60.0%	71.4%	61.3%		
Total	**50**	**11**	**5**	**14**	**80**		
	100%	**100%**	**100%**	**100%**	**100%**		

Source: Primary data

Proper appraisal and regular follow up of credit can be done by having a special cell for supervision of credit in banks and it is found that 61.3 per cent of the banks did not have any special cell for supervision of credit. 71.4 per cent of RRBs, 60 per cent of cooperative and public sector banks and 54.5 per cent of private sector banks did not have any special cell for supervision of credit. There is no significant difference among the different types of banks in having special cell for supervision of credit as Fishers exact test p=0.839>0.05.

Table no. 7 Agreement scale on borrower's repayment of installments on time

Type of bank	SD	D	N	A	SA	Mean	S.D	Kruskal-Wallis test	p value
Public	4	7	7	29	3	3.40	1.07	1.203	0.752 NS
	8.0%	14.0%	14.0%	58.0%	6.0%				
Private	0	1	2	8	0	3.64	.67		
	.0%	9.1%	18.2%	72.7%	.0%				
Coop	0	1	0	3	1	3.80	1.10		
	.0%	20.0%	.0%	60.0%	20.0%				
RRB	0	1	3	10	0	3.64	0.63		
	.0%	7.1%	21.4%	71.4%	.0%				
Total	**4**	**10**	**12**	**50**	**4**	**3.50**	**0.95**		
	5.0%	**12.5%**	**15.0%**	**62.5%**	**5.0%**				

Source: Primary data
*standard deviation values derived

Repayment of installments by the borrowers is crucial for the feasibility of agriculture credit system. The borrowers of public sector (3.40+_1.07), private sector (3.64+_0.67), cooperative banks (3.80+_1.10) and regional rural banks (3.64+_0.63) have repaid installments in time as shown by mean and standard deviation.

Further Kruskal-Wallis test shows that there is no significant difference among the different types of banks in their agreement on the statement that borrowers repay installments in time as Kruskal-Wallis test p=0.752>0.05.

Table no. 8 Agreement scale on there is poor management of funds by borrowers

Type of bank	SD	D	N	A	SA	Mean	S.D	Kruskal-Wallis test	p value
Public	1	18	9	15	15	3.18	1.14		
	2.00%	36.00%	18.00%	30.00%	30.00%				
Private	0	4	4	3	3	2.91	0.83		
	0.00%	36.40%	36.40%	27.30%	27.30%				0.236 NS
Coop	0	3	0	1	1	3	1.41		
	0.00%	60.00%	0.00%	20.00%	20.00%				
RRB	1	8	3	1	1	2.5	1.02		
	7.10%	57.10%	21.40%	7.10%	7.10%				
Total	**2**	**33**	**16**	**20**	**20**	**3.01**	**1.11**	4.251	
	2.50%	**41.30%**	**20.00%**	**25.00%**	**11.30%**				

Source: Primary data

Optimum utilization of agriculture credit funds for the right purpose by the borrowers contributes to the success of agriculture credit system. The public sector banks stated that there is poor management of funds by borrowers as the mean and standard deviation is 3.18+_1.14. The private sector banks (2.91+_0.83) as mean and standard deviation values, cooperative banks (3.00+_1.41) and regional rural banks (2.5+_1.02) have disagreed that there is poor management of funds by borrowers as denoted by mean and standard deviation. There is no significant difference among the different types of banks in their agreement on the statement that there is poor management of funds by borrowers as Kruskal-Wallis test p=0.236>0.05.

Table no. 9 Agreement scale on there is more risk associated with agriculture credit compared to other forms of credit

Type of bank	SD	D	N	A	SA	Mean	S.D	Kruskal-Wallis test	p value
Public	3	18	14	14	1	2.84	0.98	0.36	0.948 NS
	6.00%	36.00%	28.00%	28.00%	2.00%				
Private	1	4	2	4	0	2.82	1.08		
	9.10%	36.40%	18.20%	36.40%	0.00%				
Cooperative	0	2	1	1	1	3.2	1.3		
	0.00%	40.00%	20.00%	20.00%	20.00%				
RRB	1	6	1	6	0	2.86	1.1		
	7.10%	42.90%	7.10%	42.90%	0.00%				
Total	**5**	**30**	**18**	**25**	**2**	**2.86**	**1.02**		
	6.30%	**37.50%**	**22.50%**	**31.30%**	**50%**				

Source: Primary data

The agriculture productivity in India depends more on environmental factors such as monsoon, climate, soil etc. Thus there is more risk attached to agriculture compared to other sectors. The public sector banks (2.84+_0.98), private sector banks

(2.82+_1.08) and regional rural banks (2.86+_1.10) have disagreed to the risk associated with agriculture credit is similar to other forms of credit as shown by mean and standard deviation. Further, Kruskal-Wallis test shows that there is no significant difference among the different types of banks in their agreement on the statement that there is more risk associated with agriculture credit compared to other forms of credit as Kruskal-Wallis test p=0.948>0.05.

Table no. 10 Agreement scale on the banks using tools to measure risk in agriculture credit

Type of bank	SD	D	N	A	SA	Mean	S.D	Kruskal - Wallis test	p value
Public	1	2	0	42	5	3.96	.67	1.345	0.718 NS
	2.0%	4.0%	.0%	84.0%	10.0%				
Private	0	0	1	8	2	4.09	.54		
	.0%	.0%	9.1%	72.7%	18.2%				
Coop	0	0	0	5	0	4.00	.00		
	.0%	.0%	.0%	100%	.0%				
RRB	0	1	0	13	0	3.86	.53		
	.0%	7.1%	.0%	92.9%	.0%				
Total	**1**	**3**	**1**	**68**	**7**	**3.96**	**.60**		
	1.3%	**3.8%**	**1.3%**	**85.0%**	**8.8%**				

Source: Primary data

All the types of banks used tools to measure risk in agriculture credit as the mean and standard deviation was 3.96+_0.60. The public sector banks (3.96+_0.67), private sector (4.09+_0.54), cooperative banks (4.00+_0.00) and regional rural banks (3.86+_0.53) have used tools to measure risk in agriculture credit as shown by mean and standard deviation. Further, Kruskal-Wallis test shows that there is no significant difference among the different types of banks in their agreement on the statement that the bank used tools to measure risk in agriculture credit as Kruskal-Wallis test p=0.718>0.05. This is because all types of banks used tools to measure risk in agriculture credit.

Table no. 11 Agreement scale on bank vary terms and conditions from one borrower to another for a given scheme

Type of bank	SD	D	N	A	SA	Mean	S.D	Kruskal-Wallis test	p value
Public	17	22	2	9	0	2.06	1.06	2.031	0.566 NS
	34.0%	44.0%	4.0%	18.0%	.0%				
Private	1	9	0	1	0	2.09	0.70		
	9.1%	81.8%	.0%	9.1%	.0%				
Coop	0	4	0	1	0	2.40	0.89		
	.0%	80.0%	.0%	20.0%	.0%				
RRB	2	9	0	3	0	2.29	0.99		
	14.3%	64.3%	.0%	21.4%	.0%				
Total	20	44	2	14	0	2.13	0.99		
	25.0%	55.0%	2.5%	17.5%	.0%				

Source: Primary data

It is found that the public sector banks (2.06+_1.06), private sector (2.09+_0.70), cooperative banks (2.40+_0.89) and regional rural banks (2.29+_0.99) did not vary terms and conditions from one borrower to another for a given scheme as shown by mean and standard deviation There is no significant difference among the different types of banks in their agreement on the statement that the bank varies terms and conditions from one borrower to another for a given scheme as Kruskal-Wallis test p=0.566>0.05.

Table no. 12 Suggestions to reduce NPA

Suggestions	Type of banks					Test	p value
	Public	Private	Cooperative	RRB	Total		
Provision of security for loan	7	0	0	1	8	Fishers exact test	0.593 NS
	14.0%	.0%	.0%	7.1%	10.0%		
No political interference	6	0	0	1	7		
	12.0%	.0%	.0%	7.1%	8.8%		
Heavy penalty	0	1	0	0	1		
	.0%	9.1%	.0%	.0%	1.3%		
Proper Govt. policies	26	7	5	9	47		
	52.0%	63.6%	100.0%	64.3%	58.8%		
Regular follow up	11	3	0	3	17		
	22.0%	27.3%	.0%	21.4%	21.3%		
Total	**50**	**11**	**5**	**14**	**80**		
	100%	**100%**	**100%**	**100%**	**100%**		

Source: Primary data

It is observed that 58.8 per cent of the banks suggested appropriate government policies, 21.3 per cent of the banks suggested regular follow up and 10 per cent of the banks suggested provision of security for loan to reduce the NPA in agriculture credit. 100 per cent of cooperative banks, 64.3 per cent of RRBs, 63.6 per cent of private sector banks and 52 per cent of public sector banks suggested proper government policies to reduce the NPA in agriculture credit. 27.3 per cent of private sector banks, 22 per cent of public sector banks and 21.4 per cent of regional rural banks suggested regular follow up to reduce the NPA in agriculture credit. There is no significant difference among the different types of banks on the suggestions to reduce NPA in agriculture credit as Fishers exact test p=0.593>0.05.

The results of the analysis disproves the hypothesis as there is no significant difference among the different types of banks in management of non-performing assets in agriculture creditbecause in majority of NPA cases in agriculture credit was mainly due to willful default of the borrowers. The reason for default in majority of the times was announcement of debt waivers by the political leaders. The hope for announcement of debt waivers in agriculture credit makes borrowers delay the payment and subsequently it results in NPA.

Conclusions

The focus of this paper is to analyse the management of non-performing assets in agriculture credit by different types of banks in the study area. The analysis was

carried out on the process involved in pre and post sanction of agriculture credit and non performing assets management in different types of banks. Majority of the banks provided awareness to the rural population regarding the schemes and tried to reach out to the small and marginal farmers, however there were still few obstacles in getting the agriculture credit from banks. It is revealed from the analysis that there are no differences in pre and post sanction process of agriculture credit and non performing assets management in different types of banks. The non performing assets in banks were due to wrong debt waiver policies of the political parties and willful default of borrowers. In a globalized economy, non-performing assets in agricultural loans can significantly influence India's sustainable development. The Indian agriculture plays an essential role in order to stimulate economic growth and technological progress.

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