

INSTITUTIONAL AGRICULTURAL CREDIT FLOW IN INDIA RAVIKUMARA D.A¹, PROF. UMA H.R² AND DR.MADHU G.R³

ABSTRACT

Agriculture in India is one of the most important sectors of its economy. The present study tries to analyse the trends in agriculture credit flow in India and evaluate the institution-wise agriculture credit flows. The paper is based on secondary data. Secondary data collected from the Indian stat website, NABARD annual report, Ministry of Agriculture, RBI reports, Economic Survey, RRBs reports, and SSBs reports. The ANOVA, Unit root tests, Johnson cointegration test, VEC Granger causality test, Breusch-Godfrey serial correlation, Breusch-Pagan-Godfrey test of heteroskedasticity, and Jarque-Bera tests has been used to analyse the collected data. The study found that the annual growth rates of the Loan issued and loan outstanding show that there is a fluctuation in the growth rate of both. Some years AGR of the loan outstanding was higher than the loan issued, NPAs is one of the major hurdles in the agriculture flows in India. The very less amount of loan issued to north-eastern states such as Manipur, Mizoram, Nagaland, Arunachal Pradesh, and Sikkim and Union Territories (Andaman and Nicobar Islands, Dadra and Nagar Haveli, Daman and Diu, Lakshadweep). The study shows that there is a huge gap in the agriculture credit target and disbursement. Keywords: agriculture credit, disbursement, NABARD,socio-economic

Institutional agricultural credit flow in India Ravikumar D. A¹, Prof. Uma, H.R² and Dr.Madhu G.R³

INTRODUCTION

Agriculture in India is one of the most important sectors of its economy. Agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. It provides employment to nearly 61% of the total

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population and it contributes 25% to national income. Agriculture credits provide exposure to the extension worker about the structure and functioning of lending institutions which in turn helps him to guide the borrower to choose the cheap lender in the acquisition of a credit.

Rural indebtedness coupled with agrarian distress is leading the agriculturists to commit suicide which is rampant in Karnataka. Ill quality seeds, unreliable information about the crop, lack of better marketing facilities, and lack of timely availability of credit are some of the main reasons for the agrarian distress and farmer's suicides. One of the first steps taken by the Government of India towards addressing the problem was the establishment of cooperative credit societies. The cooperative credit Act was passed in 1904 with an intention of providing loans at cheaper rates of interest. Though Maclagan Committee (1915) and Royal Commission on Agriculture in India (1928) focused on the expansion of cooperatives therewas a slowdown in the cooperative movement and innumerable cooperative societies were suffered on account of heavy overdue in repayment. All India Rural Credit survey in 1951 was constituted by RBI to understand the genuine problems faced by agriculture in India and financing the rural sector.

After the establishment of SBI in 1955 and during 1969, 'lead bank' was introduced by RBI with an intention of specific identification of area and to increase credit flow, and to promote overall development in the rural area. Another landmark in the part of agricultural credit delivery was the establishment RRBs in 1975 and NABARD in 1982 and these two providing agricultural needs

Agricultural credit

Agriculture credit is the key factor to accelerate agricultural development in India the credit needs of the farmers are of three kinds. Firstly short-term credit -to finance agricultural operations like the purchase of seeds, pesticides, and fertilizers. Secondly- medium-term credit – for purchase of ploughs, agricultural equipment, tractors, and other implements to cultivate their lands with the help of modern implements.Thirdly, long-term creditforagricultural development such as improvement of land, construction of boundaries, and horticulture. And the main source of agri-credit to the farmer were the moneylenders, traders, and commission agents who charged a higher rate of interest and purchased the



agricultural product at a low price. So, it was necessary to provide institutional credit to the farmers. It was in 1935 that the Reserve Bank was founded: The Reserve Bank of India act is unusual among central to have specific provision for attention and to agricultural credit.

Sources of Agriculture Credit:

There are mainly two sources of credit to agriculture

(a) Non-Institutional/informal sources. (money lends traders, commission agents, relatives, and landlords)

(b) Institutional/ Formal sources (Cooperative credit Societies, Co-operative Agriculture and Rural Development Banks commercial banks, RRBs, NABARD, and microfinance institutions)

Importance of agriculture credit in India

Agriculture credit is necessary for the following reasons

The gestation period in agriculture is significant, which means that the period from sowing the crop to selling the produce is vast. Therefore, agriculture credit helps farmers with their livelihood until the crops are ready for sale in the market. The agriculture credit can help farmers acquire tools, seeds, fertilizers, and more, which are essential parts of their trade. Another valid reason for availing agriculture credit is to mitigate personal expenses, such as religious functions, marriage, death, and more. Additionally, such financial assistance can also aid in repaying outstanding debts.

The objective of the study

The study has the following objectives:

- 1. To analyses the trends in agriculture credit flow in India.
- 2. To evaluate the institution-wise agriculture credit flows.

The methodology of the study

The study is based on secondary data. The secondary data collected from the Indian stat website, NABARD annual reports, Ministry of Agriculture, RBI reports, Economic Survey, RRBs reports, and SSBs reports. The annual growth rate has been used to analyze the yearwise credit flows from 1970-71 to 2019-2020. The ANOVA technique has been used to find the differences in the region-wise agriculture credit flows from 2011-2019. The tables and graphs have been used in the collected time series data. Unit root tests have been used to stationarity of the data. The Johnson co-integration test has been used to check the long-run association between Agriculture GDP and agriculture Credit. Long-run causality test has



been used to the existence of long-run causality. VEC Granger causality test has been used to check the causality between agriculture GDP and agriculture credit and finally, Breusch-Godfrey serial correlation, Breusch-Pagan-Godfrey test of heteroskedasticity, and Jarque-Bera test for normality has been used to check serial correlation, Heteroscedasticity, and normality of the data.

 Table-1 Direct Institutional Credit for Agriculture and Allied Activities Total (Short Term

 and Long Term) in India (1970-1971 to 2019-2020)

(In	crores)
-----	---------

Year	Loan Issued					Loan Outstanding				
	Соор				AG	Соор				AGR
	erativ				R	erativ				
	es	SCBs	RRBs	Total		es	SCBs	RRBs	Total	
1970-71	744	-	-	818		-	-	-	-	
					7.9					
1971-72	769	15	-	883	5	1598	268	-	1865	
					30.					16.8
1972-73	958	21	-	1156	92	1837	342	-	2179	4
					2.6					10.3
1973-74	877	219	-	1187	8	1970	436	-	2405	7
					17.					13.2
1974-75	1039	274	-	1391	19	2165	564	-	2724	6
					20.					15.5
1975-76	1187	405	2	1675	42	2357	790	-	3147	3
					21.					21.6
1976-77	1431	508	16	2037	61	2796	1031	-	3827	1
					5.7					15.3
1977-78	1444	569	44	2155	9	3074	1340	-	4414	4
					22.					17.9
1978-79	1621	800	101	2641	55	3383	1825	-	5208	9
1979-80	1821	975	-	2928	10.	3850	2364	168	6382	22.5



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					87					4
					17.					18.1
1980-81	2029	1263	-	3436	35	4315	3043	180	7539	3
					25.					14.5
1981-82	2479	1496	168	4296	03	4821	3541	273	8635	4
					1.3					12.1
1982-83	2717	1225	222	4352	0	5155	4143	382	9680	0
					20.					19.0
1983-84	2938	1858	263	5244	50	5735	5280	509	11524	5
					17.					18.6
1984-85	3154	2461	310	6167	60	6367	6613	696	13676	7
					16.					18.7
1985-86	3674	2729	402	7159	09	6947	8416	871	16234	0
					7.8					10.1
1986-87	3701	3332	477	7720	4	7465	9355	1061	17881	5
					19.					17.9
1987-88	4710	3526	483	9198	15	8347	11424	1313	21084	1
					1.9					12.8
1988-89	4873	3813	420	9381	9	9408	12840	1552	23800	8
				1062	13.					16.3
1989-90	5407	4282	647	8	29	10566	15283	1838	27687	3
					-					
				1018	4.1					
1990-91	4819	4676	335	8	4	10531	17032	1753	29316	5.88
				1153	13.					
1991-92	5797	4806	596	8	25	12176	16981	1984	31142	6.23
				1253	8.6					10.0
1992-93	6484	4960	698	0	0	13769	18288	2206	34263	2
				1501	19.					
1993-94	8484	5400	752	3	82	15316	19113	2560	36988	7.95



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				1877	25.					10.1
1994-95	9876	7408	1083	3	04	16810	20920	3009	40738	4
				2369	26.					12.9
1995-96	12483	9274	1381	2	20	19126	23427	3467	46020	7
				2634	11.					10.6
1996-97	13254	10675	1748	5	20	20556	26327	4038	50921	5
				2865	8.7					
1997-98	14159	11537	2103	6	7	21390	28445	4683	54518	7.06
				3269	14.					
1998-99	15099	14663	2515	7	10	22199	29819	5389	57408	5.30
				4553	39.					41.7
1999-00	25678	16350	2985	4	26	41950	33442	5991	81383	6
				4818	5.8					12.6
2000-01	27295	16440	3966	7	3	46135	38270	7249	91654	2
				5419	12.				10550	15.1
2001-02	30569	18638	4546	5	47	52110	45106	8286	2	1
				6517	20.				12312	16.7
2002-03	34040	25256	5879	5	26	59064	53804	10261	9	1
				8342	28.				15122	22.8
2003-04	40049	36203	7175	7	00	71403	68103	11721	8	2
			1192	1053	26.				19105	26.3
2004-05	45009	48367	7	03	22	78822	95519	16709	0	3
			1530	1440	36.				23943	25.3
2005-06	48123	80599	0	21	77	82327	135603	21510	9	3
		11526	2022	1895	31.				28591	19.4
2006-07	54019	6	8	13	59	89443	169018	27452	3	1
		11347	2383	1949	2.8				30167	
2007-08	57643	2	8	53	7	65666	202796	33216	8	5.51
		16069	2649	2459	26.				35753	18.5
2008-09	58787	0	9	76	17	64045	256119	37367	1	1



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		18825	3464	2863	16.				42150	17.8
2009-10	63497	3	0	90	43	59791	315436	46282	9	9
		22279	4396	3448	20.				48932	16.0
2010-11	78121	2	5	78	42	76674	357584	55067	5	9
		31287	5445	4552	32.				58622	19.8
2011-12	87963	7	0	90	01	72545	443298	70384	7	0
	11120	48449	6368	6593	44.	11977			72175	23.1
2012-13	3	9	1	83	83	5	522478	79499	2	2
	11996		8265			13524			73698	
2013-14	4	-	2	-		5	503532	98206	3	2.11
	13846		1024			15428		11260	95085	29.0
2014-15	9	-	82	-		6	683969	3	8	2
	15329		1192			15612		13340	11043	16.1
2015-16	4	-	60	-		0	814841	1	62	4
	14275		1232			22669		15341	10482	-
2016-17	8	-	16	-		7	668109	6	22	5.08
	15032		1412			18439		17130	12797	22.0
2017-18	1	-	16	-		6	924084	1	81	9
										-
	15234		1496			17882		19743		96.5
2018-19	0	-	67	-		0	995114	2	44579	2
	14969		1628			15117		50898		
2019-20	4	-	57	-		6	-	5	-	

Source: Reserve Bank of India. (ON2120)

Table-1 presents the direct institutional credit for agriculture and allied activities total (Short Term and Long Term) in India from 1970-71 to 2019-20. The table clearly shows that the cooperatives are issued more amount of loans-issued compared to SCBs and RRBs in all the mentioned years. The cooperatives issued loan was 744 crores in 1970-71, it increases to 4819 crores in 1990-91, it further increased to 78121 and 149694 crores in 2010-11 and 2019-2020. The RRBs issued loan was 335 crores in 1990-91, it increases to 43965 crores and further increased to 162857 crores in 2019-2020. The SCBs issued loan amount also



increased from 1263 in 1980-81 to 16440 crores in 2000-01 to 484499 crores in 2012-13. The loan outstanding increases year by year in cooperatives, RRBs, SCBs, and state government credit to agriculture. The total loan outstanding was 1865 crores in 1971-72, it increases to 29316 crores in 1990-91, and 91654 in 2000-21 and it further increased to 1279781 crores in 2018-19. It is observed from the above table that the loan outstanding is higher than the loan issued in all mentioned years. The annual growth rates of the Loan issued and loan outstanding show that there is a fluctuation in the growth rate of both. Some years AGR of the loan outstanding was higher than the loan issued, NPAs is one of the major hurdles in the agriculture flows in India.

Regions/States/									
UTs	2011	2012	2013	2014	2015	2016	2017	2018	2019
	1032	1160	1310	1738	1812	2060	21970	25120	26577
Northern Region	00	00	00	00	00	00	0	0	1
North-						1300			
Eastern Region	4100	5500	7500	8700	9900	0	14400	15900	17631
	4050	4750	5760	7160	7530	8380			10602
Eastern Region	0	0	0	0	0	0	86800	94900	1
	7570	9160	1088	1373	1570	1763	19880	20860	23303
Central Region	0	0	00	00	00	00	0	0	3
	5870	7110	9320	1070	1139	1325	14940	15060	19020
Western Region	0	0	0	00	00	00	0	0	9
	1788	2302	2779	3434	3670	3394	40910	47830	53696
Southern Region	00	00	00	00	00	00	0	0	1
	4610	5619	6761	8418	9043	9510	10783	11995	13496
India	00	00	00	00	00	00	00	00	26

Table-2 Regionwise Credit to Agriculture by Scheduled Commercial Banks in India

(As on 31st March 2011 to 2019) Source: Reserve Bank of India. (ON2122)

Table-2 shows the region/state-wise credit to agriculture by scheduled commercial banks in India from 2011-2019. The highest loan received by the southern region, in 2011 southern region received 461000 crores and it increases to 367000 crores in 2015, it further increased



to 536961 crores in 2019. Thenorthernregion received the second-highest amount of loans from 2011 to 2019, the loan issued to the region in 2011 was 103200 crores, which increases to 206000 crores and 265771 crores in 2019. The lowest loan was issued to the North-Eastern Region in the mentioned year. The northern region received 4100 crores in 2011 and it increases to 17631 crores in 2019. The big states such as Tamil Nadu (163840 crores), Uttar Pradesh (139491 crores), Maharashtra (128432 crores), Andhra Pradesh (123985 crores), and Karnataka (101310 crores) received the highest amount of loans in 2019. The very less amount of loan issued to north-eastern states such as Manipur, Mizoram, Arunachal Pradesh, Sikkim Nagaland, and and Union Territories (Andaman and Nicobar Islands, Dadra and Nagar Haveli, Daman and Diu, Lakshadweep).

Table-3 ANOVA results for Regionwise Agriculture Credit by Scheduled Commercial Banks in India

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	597230612387.556	4	149307653096.889	40.842	.000
Within Groups	146228209238.222	40	3655705230.956		
Total	743458821625.778	44			

Table-3 presents the ANOVA results for region credit to agriculture by scheduled commercial banks in India from 2011-2019. The test results show that the F value is 40.842, which is greater than the table value and the significance value is 0.000, it is statistically significant at a 1 percent level. It implies that there is a difference in the region-wise agriculture loan issued from 2011 to 2019. The major reason for the difference in the loan issued is the geographical area, agricultural land, and the number of financial institutions in the states.

Table -4 Target and Achievement of Agricultural Credit Flow in India (2004-2005 to 20)19-
2020)(Rs. in Crore)	

			No.	of	%	achievement	of
Year	Target	Achievement	Accounts		Targ	et	
			(In Lakh)				
2004-2005	105000	125309	-		-		
2005-2006	141000	180486	-		-		



2006-2007	175000	229400	-	-
2007-2008	225000	254657	-	-
2008-2009	280000	301908	-	-
2009-2010	325000	384514	-	-
2010-2011	375000	468291	-	-
2011-2012	475000	511029	-	-
2012-2013	575000	607376	-	105.63
2013-2014	700000	730122.6	-	104.3
2014-2015	800000	845328.2	-	105.67
2015-2016	850000	915510	899.06	107.71
2016-2017	900000	1065756	1070.68	118.42
2017-2018	1000000	1168503	1139.13	116.26
2018-2019	1100000	1256830	-	114.06
2019-2020	1350000	696925.16#	-	-

Note: # : Upto 30.09.2019. Source: Ministry of Finance, Govt. of India. (16441) &, Lok Sabha Unstarred Question No. 1030, dated on 04.12.2015, Lok Sabha Unstarred Question No. 508, dated on 26.02.2016, Lok Sabha Unstarred Question No. 2669, dated on 01.08.2017, Lok Sabha Unstarred Question No. 4480, dated on 08.01.2019, Lok Sabha Unstarred Question No. 1584, dated on 12.02.2019, Lok Sabha Unstarred Question No. 1497, dated on 01.07.2019, Lok Sabha Unstarred Question No. 133, dated on 18.11.2019 & Rajya Sabha Starred Question No. 131, dated on 29.11.2019.

Table-4presents the target and achievement of agricultural credit flow in India from 2004-2005 to 2019-2020. The available data shows that the achievement in all mentioned years is more than the target agricultural credit flow in India. The target of agriculture flow is 280000 crores and achievement are 301908 crores in 2008-09, it increases to loan target is 575000 crores and achievement is 607376 crores. The target amount is 1100000 crores and achievement is 1256830 crores in 2018-2019. The percentage of target achievement ranges from 104 % to 116 % between 2012-13 to 2019-2020.



Table-5 Targets and Achievements of Flow of Agricultural Credit by Commercial,

Cooperative and Regional Rural Banks in India	(2011-2012 to 2019-2020) (Rs. in Crore)
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Year	Comme	rcial Banks	Coopera	ative Banks	Regiona	l Rural Banks
		Achievemen		Achievemen		Achievemen
	Target	t	Target	t	Target	t
	35500					
2011-2012	0	368616	69500	87963	50500	54450
	42000					
2012-2013	0	432491	84000	111203	71000	63681
	47500		12500		10000	
2013-2014	0	119964	0	509005	0	82652
	54000		14000		12000	
2014-2015	0	604376	0	138470	0	102483
	59000		14000		12000	
2015-2016	0	604971	0	153295	0	119261
	62500		15000		12500	
2016-2017	0	799781	0	142758	0	123216
2017-2018*	7040	8711	1560	1503	1400	1412
	79200		16500		14300	
2018-2019	0	954823	0	152340	0	149667
2019-2020	97200		20250		17550	
(Provisional)	0	1061215	0	149694	0	162857

Source: Ministry of Agriculture & Farmers Welfare, Govt. of India.

With regard to the targets and achievements of the flow of agricultural credit by commercial, cooperative, and regional rural banks in India from 2011-2012 to 2019-2020 presented in Table 5. The flow of agricultural credit achievement by commercial banks is greater than the target in all mentioned years except 2013-2014. The cooperative bank's achievement is higher than the target in all years except 2014-2015, 2017-2018, and 2018-2019. The RRBs also achieved the target agriculture loan amount except 2012-2016.



Table-6 State-wise Agriculture Credit Disbursement by Cooperative Banks in India (2018-

2019)(Rs. in Lakhs)

States/UTs	Target*	Disbursement* States/UTs		Target*	Disbursement*
			Madhya		
Aand N Islands	7000	1222.59	Pradesh	1405800	1321469
Andhra Pradesh	1002600	1157166	Maharashtra	1750700	1292799
Arunachal Pradesh	12600	479.17	Manipur	2600	4074.24
Assam	14400	2111.77	Meghalaya	7800	2127.93
Bihar	98800	85694	Mizoram	4200	1454.5
Chandigarh	0	0	Nagaland	7400	4031.63
Chhattisgarh	250600	370078.9	Odisha	1029700	1297161
Dadra and Nagar					
Haveli	700	0	Puducherry	1800	795.12
Daman and Diu	800	0	Punjab	1741800	955150.4
Delhi	1000	380.08	Rajasthan	1931900	1324529
Goa	15100	3302.47	Sikkim	3400	475.61
Gujarat	1430600	1422616	Tamil Nadu	688700	1457720
Haryana	850900	1049089	Telangana	667400	560829.7
Himachal Pradesh	135200	381538.8	Tripura	31400	23662.87
Jammu and			Uttar		
Kashmir	25800	2587.74	Pradesh	1307000	557290.1
Jharkhand	22600	671.91	Uttarakhand	100600	128925.3
Karnataka	849600	1128066	West Bengal	595400	451963.3
Kerala	504100	398734	India	16500000	15388196

Note: *: Figures are Provisional. Source: Lok Sabha Unstarred Question No. 1539, dated 01.07.2019.

Table 6reveals the state-wise agriculture credit target and disbursement by cooperative banks in India2018-2019. The data clearly shows there is a huge gap in the agriculture credit target and disbursement. Some states achieve well, and some states are performing poorly in the agriculture credit disbursement. Some states namely Manipur, Chhattisgarh, Tamil Nadu, Uttarakhand, Karnataka, and Kerala are achieving the targeted credit disbursement.

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The remaining states are failed to achieve the targeted credit disbursement. Some poorperforming states such as Arunachal Pradesh, Jharkhand, Himachal Pradesh, Goa, Dadra and Nagar Haveli, Daman and Diu, Arunachal Pradesh, Assam, Meghalaya, Mizoram, and Nagaland.

Table-7State-wiseDisbursementofTermLoanbyCommercial/RegionalRural/Cooperative Banks in India (2018-2019)

(Rs. in Crore)

States/UTs	Disbursement	States/UTs	Disbursement
Andaman and Nicobar Islands	98.29	Lakshadweep	1.52
Andhra Pradesh	40384.14	Madhya Pradesh	17298.81
Arunachal Pradesh	30.6	Maharashtra	54354.52
Assam	6021.17	Manipur	209.97
Bihar	16225.96	Meghalaya	60.81
Chandigarh	1582.82	Mizoram	345.53
Chhattisgarh	3972.96	Nagaland	126.19
Dadra and Nagar Haveli	51.15	Odisha	9990.83
Daman and Diu	33.99	Puducherry	624.4
Delhi	22541.14	Punjab	23295.66
Goa	990	Rajasthan	21572.36
Gujarat	26141.51	Sikkim	99.4
Haryana	21973.27	Tamil Nadu	62835.33
Himachal Pradesh	2324.37	Telangana	30226.08
Jammu and Kashmir	2584.54	Tripura	2233.29
Jharkhand	2217.17	Uttar Pradesh	27936.73
Karnataka	35092.86	Uttarakhand	4973.85
Kerala	32257.16	West Bengal	33677.7
Lakshadweep	1.52	India	504386.1

Source: Lok Sabha Unstarred Question No. 7, dated 03.02.2020.

With regard to the state-wise disbursement of term loans by commercial/regional rural/cooperative banks in India in 2018-2019 presented in Table 7. The total loan disbursement in 2018-19 is 504386.1lakhs. The highest loan disbursement in south states



namely Tamil Nadu, Maharashtra, Andhra Pradesh, Karnataka, West Bengal, Kerala and Telangana, and other states likely Uttar Pradesh, Gujarat, Punjab, Delhi, Haryana, Rajasthan, and Madhya Pradesh. The lowest loan disbursement in Sikkim, Andaman and Nicobar Islands, Meghalaya, Dadra and Nagar Haveli, Daman and Diu, Arunachal Pradesh, and Lakshadweep.

Table- 8 Results of Unit Root Tests

Phillips-Perron test statistic					
	InGDP InAC				
	T Statistics	Prob.*	T Statistics	Prob.*	
At Level	-1.596177	0.4768	0.736158	0.8703	
At 1 st difference	-7.005718	0.0000*	-1.856398	0.0609***	

Note: *and *** denotes statistically significant at 1and 10% level.

Table-8 presents the unit root test results for Agriculture GDP and agriculture credit. Phillips-Perron statistic test has been used to check the stationarity of the Agriculture GDP and agriculture credit from 1970-71 to 2019-2020. At level, both agriculture GDP and Agriculture credit has non-stationarity. The Agriculture GDP T statistics is -7.005718 and the p-value is 0.0000, it is statistically significant ata 1% level. It indicates that Agriculture GDP has stationarity at first difference. The agriculture credit T statistics is -1.856398 andthe pvalue is 0.0609 which is statistically significant at 10% in the first difference. It implies that agriculture credit data has stationarity in the mentioned period. Based on the unit root results cointegration test has been conducted to check the long-run cointegration between agriculture GDP and agriculture credit.

Table- 9	9 Results	of Johanson	test of Co	-integration
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Hypothesized	Trace	0.05	Prob.**	Max-	0.05	Prob.**
No. of CE(s)	Statistic	Critical		Eigen	Critical	
		Value		Statistic	Value	
None *	27.39930	25.87211	0.0321**	18.47132	19.38704	0.0675***
At most 1	8.9279	12.51798	0.1848	8.927982	12.51798	0.1848

Note: ** and *** denotes statistically significant at 5% and 10% level.

Table-9 shows the results of the Johanson test of co-integration for agriculture GDP and credit. The trace statistic is 27.39930 and P-value is 0.0321, it is statistically significant at



a 5% level. Max-Eigen Statistic is 18.47132 and p-value is 0.0675, it is statistically significant at 10% level. Thus, the null hypothesis (r=0) is rejected. It implies that there is co-integration between the agriculture GDP and agriculture credit.

	В	SE	T- statistics	P- Value
EC	-0.004138	0.001479	-2.798043	0.0064
C(2)	-0.309332	0.124237	-2.489856	0.0149
C(3)	-0.263284	0.128896	-2.042603	0.0444
C(4)	0.705748	1.620992	0.435380	0.6645
C(5)	-1.640216	1.553486	-1.055829	0.2942
C(6)	-0.679688	0.398323	-1.706374	0.0918
C(7)	-0.001700	0.000765	-2.222121	0.0291

Table -10 Results of Long-Run Causality and Error Correction Term

Table-10 presents the results of long-run causality and error correction terms. It is found that the error correction term is negative which indicates that there is anexistence of long-run causality. It implies that if there is any deviation in the long-run relationship among variables then there is an error correction mechanism and a negative sign express that the system will go back to the long-run equilibrium with 0.4% speed.

Table- 11 VEC Granger Causality/Block Exogeneity Wald tests

Null hypothesis	Wald test/χ2	P-value	Conclusion
D(LCR) does not Granger cause of D(laGDP)	6.517061	0.0107***	Causality
D(LAGDP) does not Granger cause of D(IACR)	9.260090	0.0027**	Causality

Note: ** and *** denotes statistically significant at 5% and 10% level.

Table-11 shows the results of the VEC Granger causality/block exogeneity Wald tests. Granger causality test has been conducted for the short run. The results reveal that agriculture credit (Chi-square =6.517061, P= <0.10) is Granger cause of agriculture GDP. It is significant at a 10% level. Agriculture Gross Domestic Product (Chi-square = 9.26009, p-value = 0.0027) is Granger cause on agriculture credit. It is statistically significant at a 5% level. Therefore, it can be concluded that bidirectional causality running from agriculture GDP and agriculture credit is found.



Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	2.665123	4	0.6153	0.669217	(4, 74.0)	0.6154
2	7.210779	4	0.1252	1.866970	(4, 74.0)	0.1252
3	2.271133	4	0.6860	0.568781	(4, 74.0)	0.6861
4	1.133503	4	0.8889	0.281721	(4, 74.0)	0.8889
5	2.219538	4	0.6955	0.555668	(4, 74.0)	0.6955
6	2.459033	4	0.6520	0.616615	(4, 74.0)	0.6520
7	2.419338	4	0.6591	0.606500	(4, 74.0)	0.6592
8	0.560466	4	0.9674	0.138766	(4, 74.0)	0.9674
9	5.660137	4	0.2260	1.450201	(4, 74.0)	0.2261
10	1.752210	4	0.7812	0.437300	(4, 74.0)	0.7812

Table- 12Results of VEC Residual Serial Correlation LM Tests

Null hypothesis: No serial correlation at lag h

Table-12 presents the results of the VEC residual serial correlation LM test. The LRE* stat is 2.665123 and P-value is 0.6153 and F stat is 0.669217 and the p-value is 0.6154. based on the test results do not reject the null hypothesis any serial correlation at lag h. it implies that there is no correlation, and the model has normally distributed.

Table-13 results VEC Residual Heteroskedasticity Tests (Levels and Squares)

Chi-sq	df	Prob.
3.28987	30	0.1107

Table-13 presents the results of VEC residual heteroskedasticity Test statistics, as in the table chi-square vale is 3.28987 and p-value is 0.1107, it statistically insignificant, based on the test statistics cannot reject the null hypothesis of Homoscedasticity. It implies that there is no heteroskedasticity and the model has normally distributed.



Table-14 results Jarque - Bera test for normality

Jarque-Bera	df	Prob.
0.125574	2	0.9391

Table-14 shows the results of the Jarque - Bera test for normality. As in the table, the chi-square value is 0.125574, and the p-value is 0.9391, it is statistically insignificant. Based on the test results do not reject the null hypothesis of normal distribution, it implies that the model has normally distributed.

CONCLUSION

Agriculture in India is one of the most important sectors of its economy. Agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. It provides employment to nearly 61% persons of the total population and it contributes 25% to national income. Agriculture credits provide exposure to the extension worker about the structure and functioning of lending institutions which in turn helps him to guide the borrower to choose the cheap lender in the acquisition of a credit.

Rural indebtedness coupled with agrarian distress is leading the agriculturists to commit suicide which is rampant in Karnataka. Ill quality seeds, unreliable information about the crop, lack of better marketing facilities, and lack of timely availability of credit are some of the main reasons for the agrarian distress and farmer's suicides. the loan outstanding is higher than the loan issued. The annual growth rates of the Loan issued and loan outstanding show that there is a fluctuation in the growth rate of both. Some years AGR of the loan outstanding higher than the loan issued, NPAs is one of the major hurdles in the agriculture flows in India. The major reason for the difference in the loan issued is the geographical area, agricultural land, and the number of financial institutions in the states. The RRBs achieved the target agriculture loan amount except for some years. Agriculture credit and agriculture GDP are stationary at 1st difference, based on the unit root results cointegration test has been conducted to check the long-run cointegration between agriculture GDP and agriculture credit. there is co-integration between the agriculture GDP and agriculture credit. there is any deviation in the long-run relationship among variables then there is an error correction mechanism and a negative sign express that the system will go back to the long-run equilibrium with 0.4% speed. The study found that there is a



bidirectional causality running from agriculture GDP and agriculture credit. there is no correlation and heteroskedasticity between the ag, and the model has normally distributed.

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