

Impact of credit on agricultural growth : Evidences from the States of India

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Abstract

The role of formal credit institutions has been crucial in fostering agricultural growth in India. This research paper examines the impact of credit disbursed by Scheduled Commercial Banks (SCBs) on the agricultural sector's development. Using state-wise temporal and spatial data spanning from 2004-05 to 2021-22, the study analyzes the distribution of agricultural credit, its correlation with agricultural GDP, and the elasticity of credit in driving growth. Despite an overall increase in agricultural credit, significant regional disparities remain, affecting the efficiency of credit policies and agricultural advancement.

The study underscores the need for targeted policy interventions to address regional imbalances and promote equitable access to financial resources. It recommends enhancing financial support mechanisms, improving credit accessibility, and customizing policies to

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suit the specific agricultural requirements of each state to achieve sustained agricultural development in India.

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1. Introduction

Agriculture has always played a pivotal role in India's socio-economic landscape, irrespective of the timeline. As M.S. Swaminathan aptly stated, "If agriculture goes wrong, nothing else will have a chance to go right in the country." Despite India experiencing a structural shift, with economic activity transitioning from agriculture to the services sector, agriculture remains a dominant employer, particularly in rural areas. According to the International Monetary Fund (IMF), agriculture still engages a substantial proportion of the population, with around 50% of India's workforce employed in the sector, as noted by the World Bank. This highlights the sector's enduring importance in supporting livelihoods and food security. World Bank further emphasizes that agricultural finance plays a crucial role in supporting marginalized farmers, helping them grow wealth and contributing to the broader aspect of global food chain. An analysis by the IMF suggests that the credit helps farmers in many ways such as adoption of newer technologies, better risk management or adoption of newer and sustainable methods of cultivation, without which the farmers especially in the developing countries can be trapped in farming that barely meet their daily food requirements.

Credit has always been a critical salient element of India's agricultural sector and it has the responsibility to feed the largest population in the world after it surpassed China's Population. India's journey towards institutional credit for agriculture began with the All India Rural Credit Survey conducted by the Reserve Bank of India (RBI) in 1954, which laid the foundation for formal credit systems in rural areas through cooperatives and commercial banks. The need for reforms and investments in the agricultural sector has grown significantly over time, particularly as the sector's contribution to India's GDP has dwindled. In 2023, agriculture accounted for 18.2% of India's GDP, a stark contrast to its contribution of nearly 50% in the 1950s.

Despite agriculture's relatively modest contribution to GDP currently around 16.5% the sector still provides employment to approximately 42%

of the workforce. Moreover, India has witnessed an average annual growth rate of 4.18% in agriculture over the past five years, according to the Economic Survey 2022-23, underscoring the sector's critical role in the economy. But, Despite India's efforts of providing access to formal credit to farmers, still it is a persistent challenge which is not eliminated yet. Also, there has been a prevalence of regional disparities among the Indian states when it comes to the Agricultural credits provided by the Scheduled Commercial Banks.

Institutional credit has long been a cornerstone of India's agricultural policy, dating back to the Cooperative Societies Act of 1904, which marked the emergence of cooperatives as key players in rural finance. The share of cooperatives in the era of 1950s was about 3 percent which rose to 11 percent in 1961 but yet, the formal credit was still not used for production purposes in the economy. It was only after the second five year plan, when the need was felt for a separate wing to look after capital formation in agriculture on the basis of the technical and economic feasibility of investments. This gave rise to the agricultural refinance corporation in 1963. Around the similar timelines, the nationalization of 14 banks also took place, followed by the imperial Bank being converted to the State Bank of India and the World Bank also played its part in running projects in different parts of the country to look after the agricultural credit. These all incidents led to the strengthening of the credit system in India.

Through this study, we try to discuss upon the issues and analyse the trends and patterns that can be observed in the Indian credit system to the respective field and deliberate upon the possible solutions and the way forward in order to improve the agricultural system stronger and work in line with the demands of the Indian farmers.

The rest of the paper is organized as follows. Section 2 gives the literature review, Section 3 provides the objectives, describes variables and data sources along with the methodology adopted, Section 4 focuses on analysis and interpretation and Section 5 gives the conclusion and suggestions of the study.

Literature Review

The credit is required by farmers mainly because of the gap between the realization of income and the act of expenditure and for the act of investment [1]. A study conducted in Uganda aimed to explore the short-term and long-term relationship between commercial bank credit and agricultural GDP. The findings revealed a positive long-term relationship

between the two. Additionally, the study highlighted a stronger connection between agricultural output and credit allocated to production, compared to credit directed towards processing and marketing activities[2]. Small and Marginal farmers barely meet their daily needs for food and capital thereby leaving them with little or no investable capital. Which hampers them to invest in farm practices given the constrained supply of agricultural credit. The Vyas Committee pointed out a decade ago that the share of agricultural credit to total credit is declining along with the pace of credit to agriculture. [3]. In the sixties, there was a credit switchover towards a more production oriented approach rather than a Security oriented approach making the credits to be disbursed for productive fronts rather than for debt redemption. [4]. Indian agriculture holds significant potential to address issues such as poverty, unemployment, and the shortage of raw materials. Farmers' decisions regarding the purchase of inputs, raw materials, crop selection, plows, and other equipment are largely influenced by the amount of capital they possess. A study done by[5] suggests that the Agricultural GDP is directly linked to the increase in the respective credits. There is a major need for financial inputs in this industry because of which only a small number of farmers can afford to be independently employed. Total agricultural credit as a percentage of gdp has increased from 16% in FY1982 to 42% in FY2017 and direct short term loans increased from 22% in 1990-91 to 123% in 2015-16 implying that the formal institutional credit is meeting all the requirements of the farmers. The loans outstanding to farmers through commercial banks is 75% followed by 13% through commercial banks and 12% in RRBs[6]. A study by [7] indicates that there has been the highest increase in agricultural allocation from 2001-02 to 2010-11. The Scheduled Commercial Banks (SCBs) have contributed more than the cooperative banks from 2004. This enhanced institutional credit has led to the inferior role of the cooperatives and rural banks towards agricultural credit. Studies in developing countries of Indian, Senegal, Ghana and Pakistan show a boost in agricultural productivity and technical efficiency along with an increase in the ability to obtain credit. The World Bank has found that only 1.294 million out of 33 million farmers in Indonesia received the government aided scheme, Kredit Usaha Rakyat (KUR). Credit is an important catalyst to boost agricultural production helping in purchase of seeds, labor and fertilizers, marketing, processing and storage. Additionally the non-institutional credit sources also play an important role in the contribution to the total credit. [8].

Methodology

Research Objectives

- To assess the distribution of agricultural credit among states from 2004-05 to 2021-22.
- To evaluate the State wise Compound Annual Growth Rates (CAGR) of total and agricultural sector credit by SCBs from 2004-05 to 2021-22.
- To analyze the proportion of agricultural credit relative to agricultural GDP across states.
- To investigate the credit elasticity of agricultural growth in various states of India.
- To analyze statewide novennial CAGR in the credit disbursed to agriculture by Scheduled Commercial Banks.

Data Sources

The data on the Gross State Domestic Product, state wise credit to Agriculture by scheduled commercial banks and total credit by Scheduled Commercial Banks has been taken from the Reserves Bank of India's Handbook of Statistics on Indian States. The data on the credit subsidy is sourced from the data available on the finance accounts, Ministry of Farmers welfare.

Tools aor Analysis

The methodology used to compute the growth in overall Agricultural GDP and agricultural expenditure involves calculating the Compound Annual Growth Rate (CAGR).

CAGR is usually estimated by using the following semi log functional form;

$$\ln(y) = \ln(a) + t \ln(b) + u$$

Where, $y \rightarrow$ Dependent variable whose growth rate is to be estimated, $t \rightarrow$ Independent variable (time) $u \rightarrow$ Disturbance or error term. 'a' and 'b' are the parameters to be estimated from sample observations. The regression coefficient b is estimated by ordinary least squares (OLS) technique. The Compound Average Growth Rate (CAGR) in % term is estimated as:

$$\text{CAGR} = \{\text{antilog}(b) - 1\} * 100$$

Furthermore, the agricultural Gross Domestic Product (GDP) and State Gross Domestic Product (SGDP) figures were converted to a base year of 2011-2012, ensuring consistency in our analysis.

The conversion of GDP figures to a new base year can be done using the following formula:

$$\text{Adjusted GDP} = \text{Current Year GDP} \times \frac{\text{Price Index of base year}}{\text{Price Index of Current Year}}$$

Since, Elasticity measures the responsiveness of one variable to changes in another. The formula for elasticity (E) is:

$$E = \frac{\% \text{ change in dependent variable}}{\% \text{ change in independent variable}}$$

Where in our study:

- Dependent Variable - Agricultural GDP, which represents the total output of the agricultural sector.
- Independent Variable - Credit to Agriculture sector by Scheduled Commercial Banks, reflecting the financial resources available to farmers and agricultural businesses.

A higher elasticity value suggests that even minor changes in credit can result in substantial shifts in agricultural output, indicating a strong reliance on financial support. In contrast, a lower elasticity value implies that fluctuations in credit have little impact on Agricultural GDP.

The calculation on the per hectare availability of credit was also computed by taking into account the Gross sown area of the Indian states and the credit disbursed by the scheduled commercial banks to the respective states. It was done as under:

$$\text{Per hectare availability of credit} = \frac{\text{Gross sown area}}{\text{Credit Disbursed}}$$

Results and Discussion

It was observed from the analysis that the share of agricultural credit from period 2004-05 to 2021-22 has a downward sloping trend line with an Indian average of 11.52% of the total credit directed towards agriculture. This suggests that most states have a higher agricultural credit share compared to the national average. The states with Highest Share include Bihar with the highest average share of 34.22%, indicating a significant

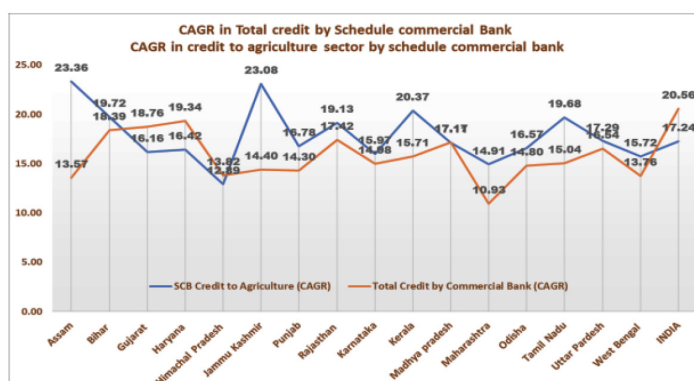
proportion of agricultural credit relative to the total credit by SCB in the state. It was then followed by West Bengal and Punjab showing relatively high shares at 29.68% and 28.36% respectively. On the contrary, the states with Lowest Share States include Maharashtra with the lowest average share of 5.60%, reflecting a much lower priority for agricultural credit to total credit in the state.

Jammu & Kashmir and Gujarat follow with low shares of 10.57% and 12.71% respectively.

There are significant fluctuations among the states, indicating significant differences in how different states prioritize agricultural credit.

The States Near the National Average include Kerala and Tamil Nadu show placing relatively close to the national average, at 19.82% and 16.54%. Uttar Pradesh is placed at 15.36%, above the national trend.

The Moderate Share of States include Haryana at 22.22%, Rajasthan 25.07%, and Karnataka 17.00% represent mid-tier levels in terms of their agricultural credit share.



Source: Author's own calculation based on RBI database.

Figure 1

State wise CAGR in total credit by SCBs & CAGR in credit to agricultural sector by SCBs from 2004-05 to 2021-22.

The variations suggest that agricultural credit allocation is significantly higher in agrarian economies like Bihar and Punjab, while industrial or service-based states like Maharashtra allocate a lower proportion of their total credit to agriculture.

Figure 1 compares the Compound Annual Growth Rate (CAGR) of total credit provided by scheduled commercial banks (SCBs) and credit to the agricultural sector by SCBs across various states. The blue line represents the CAGR in credit provided to the agricultural sector.

The orange line shows the CAGR in total credit provided by SCBs.

It can be observed that Jammu and Kashmir and Kerala show high peaks for total credit CAGR of 23.08% and 20.37%, respectively, indicating a robust overall credit growth.

On the other hand Bihar followed by Haryana which has the highest growth in agricultural credit of 19.72% and 19.34% respectively indicating strong bank support for the agricultural sector there.

Jammu and Kashmir, Karnataka, and Punjab have significantly higher overall credit growth compared to agricultural credit growth, with large gaps between the two lines in these states.

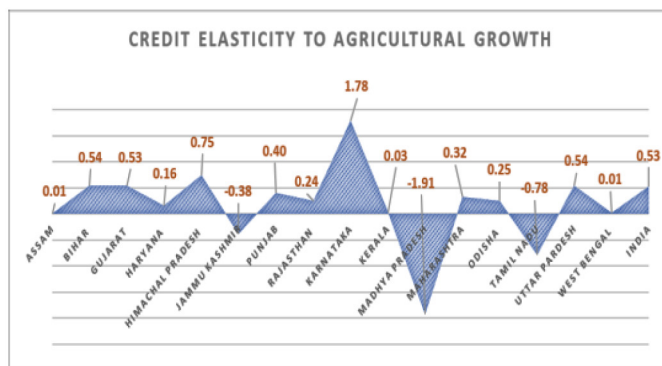
Agricultural Credit Growth:

Bihar, Haryana, and West Bengal show strong agricultural credit growth, with the blue line either approaching or surpassing the orange line.

Maharashtra has a particularly low growth rate in both categories (10.93% total credit CAGR, 14.91% agricultural credit CAGR).

The national average for total credit growth (orange line) is 17.24%, while agricultural credit growth (blue line) is 15.72%. This suggests that overall, total credit is growing faster than agricultural credit in India. In states like Gujarat, Rajasthan, and Uttar Pradesh, the CAGRs for both total credit and agricultural credit are relatively close, indicating a balanced credit distribution between agriculture and other sectors.

The graph highlights the variations in credit growth patterns across states. Some states, like Bihar and West Bengal, are receiving more focused agricultural credit, whereas others, like Jammu and Kashmir and



Source: Author's own calculation based on RBI database.

Figure 2

State wise Credit Elasticity to Agricultural Growth from 2004-05 to 2021-22.

Karnataka, show a stronger emphasis on overall credit growth. The national trend indicates that while total credit is growing faster, agricultural credit is not far behind in many regions.

Figure 2 depicts the percentage of agriculture credit to the total credit of commercial banks. Tamil Nadu has the highest agricultural credit to agricultural GDP ratio at 1.87%. This suggests a high level of credit support for agriculture relative to its agricultural GDP.

Kerala follows with a credit ratio of 1.55%, indicating that a substantial amount of agricultural credit is being extended relative to the state's agricultural production.

Karnataka is also above 1%, with a credit ratio of 1.03%. On the lower end Assam has the lowest ratio at 0.23%, showing limited agricultural credit compared to its agricultural GDP.

West Bengal and India overall are also low, with ratios of 0.26% and 0.40%, respectively, indicating that agricultural credit as a percentage of agricultural GDP is quite modest at the national level.

Data suggests that the states with higher agricultural credit ratios like Tamil Nadu and Kerala indicate better financial support for agricultural activities compared to their agricultural GDP.

The Figure 2 displays the credit elasticity coefficients across various Indian states Credit elasticities of different Indian states from the period 2005-06 to 2021-22. It was observed that the Indian Average stands at 0.53, indicating for a 1% increment in agricultural credit leading to a rise of 0.53% growth in Agricultural GDP. The state of Karnataka has the highest Credit Elasticity with 1.78 which is then followed by Jammu Kashmir with 0.75 and Bihar and Uttar Pradesh at 0.54.

On the contrary it was observed that a credit elasticity of -1.91 is seen in Maharashtra followed by 0.78 in Tamil Nadu and -0.38 in Jammu Kashmir. There were also results for negligible credit elasticities with states including Assam and West Bengal at 0.01 followed by Madhya Pradesh at 0.03.

The credit elasticity analysis shows that the elasticity varies significantly across Indian states. This could be attributed to different factors such as agricultural infrastructure, credit access mechanisms, financial literacy, and policy implementations.

The analysis on the Per hectare availability of credit implies a national average for per hectare credit availability to agriculture is ₹3.20 Lakhs per hectare.

Top States for Credit Availability include Uttar Pradesh with a per hectare credit availability of ₹13.68 lakhs per hectare far exceeding the

national average. This implies that a substantially higher amount of credit is provided per unit of agricultural land in Uttar Pradesh compared to other regions. It is then followed by Karnataka showing a high level of agricultural credit at ₹12.91 lakhs per hectare, placing it as another state with strong credit support for agriculture.

The states with Moderate Credit Availability include Punjab at ₹4.69 lakhs per hectare, followed by Himachal Pradesh with ₹4.43 per hectare, and Gujarat with ₹2.83 lakhs per the Hectare. These states exhibit moderate levels of credit availability, higher than the national average, but still much lower than top performing states of Uttar Pradesh and Karnataka.

The states with Low Credit Availability are Assam having the lowest per hectare credit availability at ₹1.32 lakh as per hectare, indicating a significant lag in providing sufficient agricultural credit per unit of land compared to other states and the national figure. There is a stark contrast between states like Uttar Pradesh and Karnataka, which receive significant per hectare credit, and other states like Assam and Madhya Pradesh, which lag far behind.

The state wise analysis done novennial from 2004-05 to 2021-22 for the Credit disbursed by the Scheduled Bank to the Agriculture shows that most of the states have major rise in the CAGR of agricultural credit in the first half of the time period as compared to the second half of the respective time period

The results are inline with the prior empirical findings. Manoharan and Varkey studied state wise variation and found that agricultural credit is significantly impacting productivity [9]. Shivaswamy et al., found that credit alone is not influencing the productivity and the work stressed the importance of institutional efficiency, input utilization and infrastructure availability. This synthesis provides a concise foundation for the concluding discussion on policy implications and targeted credit strategies [10].

Conclusion

This research underscores the significant role the formal credit system plays in driving agricultural growth across Indian states, with substantial evidence highlighting both the strengths and regional disparities within the existing credit landscape. Despite an overall increase in agricultural credit through Scheduled Commercial Banks (SCBs) from 2004-05 to 2021-22, the findings indicate regional differences in the distribution, availability, and impact of this credit on agricultural GDP. States with a greater agricultural focus, such as Bihar, benefit more from credit accessibility, whereas industrial or service sector oriented states like Maharashtra exhibit lower credit elasticity.

This study reveals that while some states showcase responsive credit environments that positively correlate with agricultural productivity, others struggle with limited accessibility or credit inefficiencies, resulting in constrained agricultural advancement. This variance is particularly evident in per-hectare credit availability and credit elasticity, where regions like Uttar Pradesh and Karnataka lead with above-average figures, contrasting sharply with states like Assam and Madhya Pradesh, which lag behind.

To achieve equitable agricultural development across the country, the study recommends targeted policy interventions to bridge these regional disparities. Enhancing financial support mechanisms, tailoring credit accessibility initiatives, and implementing state-specific policy frameworks are pivotal steps toward sustaining agricultural growth and ensuring financial inclusion for marginalized farmers across India's diverse agrarian landscape.

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