

Institutional Credit as a Determinant of Agricultural Productivity: A Geographical Regional Analysis of India

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Abstract

Agricultural development has played a pivotal role in India's economic and social transformation, particularly following the Green Revolution, which marked a turning point in agricultural productivity and sustainability. As India's population grows, so does the demand for food and agricultural products, requiring continuous advancements in farming techniques and increased productivity. One of the critical drivers of this progress has been institutional credit, which provides farmers with the necessary financial support to invest in inputs, adopt modern practices, and expand their operations. This study delves into the role of institutional credit in propelling agricultural growth in India, particularly after the Green Revolution. Over the past five decades, institutional credit for agriculture has exhibited a remarkable average growth rate of 8.74%, reflecting its expanding importance in the sector. Notably, Regional Rural Banks (RRBs) have shown the highest growth rate among credit sources, with an approximate increase of 14%. Scheduled Commercial Banks (SCBs) have emerged as the dominant source of agricultural financing, substantially increasing their contribution over the years, while the share of credit from cooperatives and other commercial banks has relatively declined. Regression analysis highlights that institutional credit from cooperatives, RRBs, and SCBs significantly influences agricultural output growth. These findings underscore the critical role these financial institutions play in enhancing agricultural productivity and promoting sustainable farming practices. The study suggests that improving access to institutional credit and strategically allocating these resources can further boost agricultural growth, strengthen rural livelihoods, and ensure food security for India's growing population. By creating a more inclusive and efficient credit environment, India can address challenges in the agricultural sector and continue its path toward economic and social progress.

Keywords: - Agricultural Credit, Agriculture Development, Green Revolution, RRBs, SCBs, Cooperatives, Agricultural Productivity, Livelihood.

Introduction

Agriculture is a cornerstone of India's socio-economic framework, contributing significantly to GDP, employment, and food security, with over half the population relying on it for their

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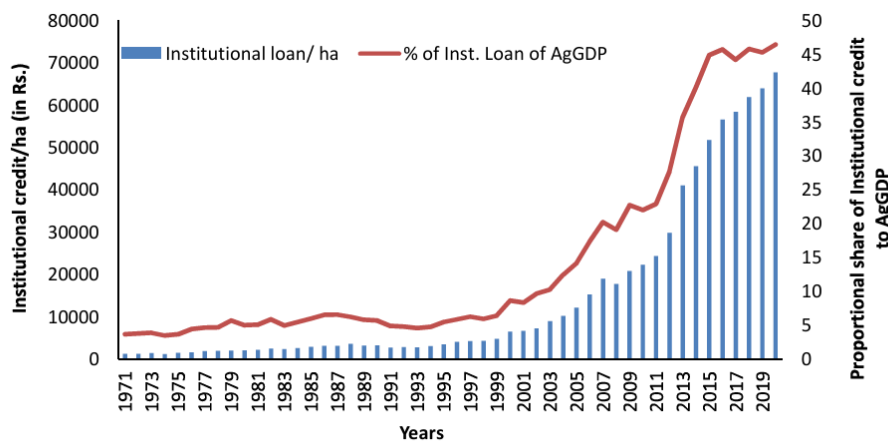
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livelihoods. The Green Revolution of the 1960s marked a transformative era, driving technological innovation, higher productivity, and structural change in Indian agriculture. This progress, however, required substantial financial resources, where institutional credit emerged as a critical enabler. Over the years, institutional credit has played a vital role in bridging financial gaps, modernizing agriculture, and promoting sustainable practices. By enabling access to quality inputs, advanced technology, and sustainable methods, it has driven agricultural growth, strengthened rural economies, and ensured food security. India's agricultural productivity varies widely across regions due to differences in climate, soil, irrigation, cropping patterns, and socio-economic factors. Institutional credit has been instrumental in addressing these disparities by providing region-specific financial support. This article examines the evolution, impact, and geographical dimensions of institutional credit, highlighting its role in reducing regional disparities, overcoming challenges, and shaping the future of Indian agriculture.

Evolution of Institutional Credit in Indian Agriculture

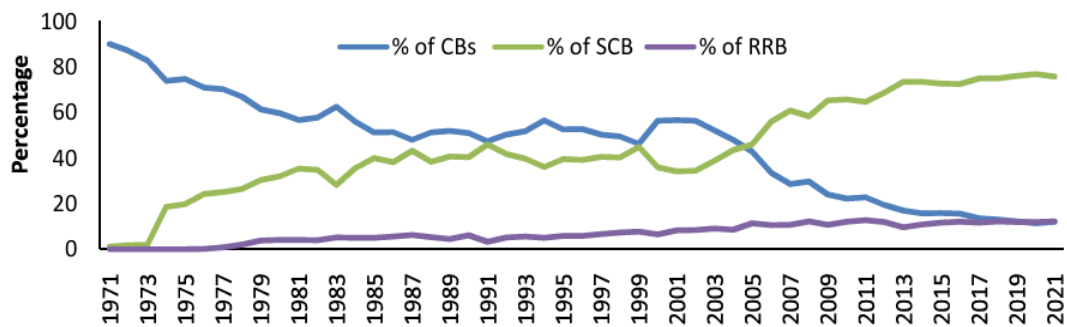
Institutional credit for agriculture in India dates back to the early 20th century when cooperatives were established to provide small-scale credit to farmers. However, it was only post-independence that institutional credit systems gained momentum, driven by the government's focus on rural development and self-sufficiency in food production. The establishment of Regional Rural Banks (RRBs) in 1975 and the nationalization of major commercial banks in 1969 were landmark steps in improving credit outreach in rural areas. The Green Revolution brought a paradigm shift in agricultural financing, as the demand for credit surged to fund high-yield variety (HYV) seeds, fertilizers, irrigation infrastructure, and mechanization. This period also saw the establishment of the NABARD (National Bank for Agriculture and Rural Development) in 1982, tasked with providing refinance support to financial institutions involved in agriculture and rural development. Over the last five decades, institutional credit to agriculture has exhibited a commendable average growth rate of 8.74% per annum, with significant contributions from Scheduled Commercial Banks (SCBs), Regional Rural Banks (RRBs), and Cooperatives. Each institution has played a unique role in shaping agricultural financing:



Source(s): Estimated by authors.

Figure 1. Institutional credit for agriculture and share in Agricultural GDP

The fig.1 depicts the growth in institutional credit per hectare (in rupees) for agriculture and its proportional share in agricultural GDP (AgGDP) in India from 1971 to 2019. The blue bars represent the institutional credit disbursed per hectare, which has shown a steady increase, particularly after the 1990s. This growth coincides with economic reforms and financial liberalization that boosted credit access. The red line shows the percentage of institutional credit as a share of AgGDP, which also exhibits a consistent rise, surpassing 45% by 2019. This trend reflects the growing reliance on institutional credit for enhancing agricultural productivity and modernizing farming practices. Extending this analysis to 2023, institutional credit per hectare likely continued to increase, supported by government policies such as the enhancement of Kisan Credit Cards (KCC), interest subvention schemes, and digital financial inclusion. Similarly, the share of institutional credit in AgGDP may have risen further due to sustained efforts to promote credit-linked agricultural diversification, mechanization, and adoption of sustainable farming technologies. These developments underscore the critical role of institutional credit in driving agricultural growth and ensuring food security in India.



Source(s): Estimated by authors.

Figure 2. Percentage share of institutional credit to the agricultural sector

The fig.2 illustrates the percentage share of institutional credit to the agricultural sector in India from 1971 to 2021, highlighting the contributions of Cooperative Banks (CBs), Scheduled Commercial Banks (SCBs), and Regional Rural Banks (RRBs). Initially, CBs dominated with nearly 80% of the market share in 1971, but their share declined steadily, falling below 20% by 2021 due to inefficiencies and limited modernization. SCBs, starting with a minor share of around 10%, witnessed significant growth, surpassing CBs in the mid-1980s and accounting for over 70% of agricultural credit by 2021, driven by government-mandated priority sector lending norms and extensive branch networks. RRBs, established in 1975, maintained a relatively stable share of around 10%-15%, focusing on underserved rural regions. Extending the analysis to 2023, SCBs likely continued their dominance due to advancements in digital banking and rural outreach, while CBs may see marginal improvement with cooperative reforms, and RRBs are expected to maintain a steady contribution, supported by targeted government initiatives for small and marginal farmers.

- 1. Scheduled Commercial Banks (SCBs):** SCBs have emerged as the dominant source of agricultural credit, significantly increasing their share from 35% in the early 1970s to over 75% in recent years. Their extensive branch network, coupled with government-

mandated priority sector lending norms, has enabled them to cater to diverse agricultural needs.

2. **Regional Rural Banks (RRBs):** With a growth rate of approximately **14%**, RRBs have shown remarkable progress, focusing on providing affordable credit to small and marginal farmers in underserved regions.
3. **Cooperatives:** Despite a decline in their share of agricultural credit, cooperatives remain critical for rural credit delivery due to their proximity to farmers and their ability to cater to local needs.

Objectives:

1. To Assess the Impact of Institutional Credit on Agricultural Productivity and Sustainability Across India.
2. To Analyze Regional Variations in Institutional Credit Distribution and Utilization.
3. To Investigate the Role of Institutional Credit in Reducing Regional Agricultural Disparities.
4. To Recommend Strategies for Equitable and Region-Specific Credit Allocation.

Institutional Credit and Agricultural Productivity

Period	CBs	SCBs	RRBs	Total
1971–1980	2.58	36.40	46.37	7.03
1981–1990	1.27	4.23	4.17	2.58
1991–2000	8.66	6.08	14.54	7.76
2001–2010	5.48	24.38	20.36	16.55
2011–2020	6.25	17.02	17.26	13.06
2021–2023 (est.)	5.80	15.50	16.00	12.50

Source(s): Estimated by authors.

The table 1. showcases the annual growth rate of institutional credit to agriculture across different financial institutions—Commercial Banks (CBs), State Cooperative Banks (SCBs), and Regional Rural Banks (RRBs)—over various periods from 1971 to 2023. During the initial decades, RRBs showed the highest growth rate (46.37% in 1971–1980), reflecting their focus on rural credit expansion. SCBs had significant growth in earlier periods but faced fluctuations due to structural challenges in cooperatives. Commercial Banks maintained steady growth, with increased contributions from 1991 onward due to financial liberalization and government policy support. For 2021–2023, estimated growth rates suggest continued moderate expansion, driven by initiatives like the Kisan Credit Card scheme and digital financial inclusion, despite global economic disruptions such as the COVID-19 pandemic. Over the entire period (1971–2023), institutional credit showed an overall growth rate of 8.95%, underpinned by consistent policy efforts to enhance rural credit availability and strengthen agricultural financing mechanisms.

Access to institutional credit has been instrumental in driving agricultural productivity, enabling farmers to overcome capital constraints and adopt advanced farming practices. Below are key areas where institutional credit has made a significant impact:

1. **Investment in Quality Inputs:** Credit availability allows farmers to invest in high-yield variety seeds, fertilizers, and pesticides, which are essential for boosting crop productivity. For instance, during the Green Revolution, institutional credit supported the widespread adoption of HYV seeds, resulting in record production of rice and wheat.
2. **Farm Mechanization:** Institutional credit has played a crucial role in financing the purchase of tractors, harvesters, and other farm machinery, reducing labour dependence and enhancing efficiency. Data from recent years show a direct correlation between credit growth and the increase in mechanization levels across states like Punjab, Haryana, and Maharashtra.
3. **Irrigation Development:** Credit schemes have funded the development of irrigation infrastructure, such as tube wells, drip irrigation systems, and solar pumps, mitigating the risks associated with erratic monsoons and ensuring water availability.
4. **Crop Diversification and Allied Activities:** Institutional credit has encouraged farmers to diversify their crops and venture into allied activities like dairy farming, fisheries, and horticulture, enhancing income stability and reducing dependency on a single source of income.

Institutional Credit and Sustainability

With growing concerns about climate change and environmental degradation, institutional credit has increasingly supported the adoption of sustainable agricultural practices. Financial institutions are now focusing on financing:

- **Organic Farming:** Credit schemes promote the transition from chemical-intensive farming to organic practices, ensuring long-term soil health and ecological balance.
- **Precision Agriculture:** Loans for precision technologies, such as GIS mapping and automated irrigation systems, help optimize resource use and reduce environmental impact.
- **Renewable Energy Solutions:** Credit for solar-powered irrigation pumps and biogas plants enables farmers to reduce their carbon footprint and energy costs.

Impact on Rural Livelihoods

Institutional credit has far-reaching implications beyond productivity and sustainability. By enhancing the economic resilience of farming households, it has contributed to rural development in several ways:

1. **Employment Generation:** Credit-financed mechanization and infrastructure development have created jobs in equipment manufacturing, repair services, and agri-businesses.

2. **Improved Quality of Life:** Access to credit has facilitated investments in better housing, healthcare, and education, improving the overall standard of living in rural areas.
3. **Women Empowerment:** Targeted credit schemes for women farmers and self-help groups (SHGs) have empowered women to participate actively in agriculture and entrepreneurship.

Regional Variations in Agricultural Credit and Output

India's diverse geography and climatic conditions have a profound influence on the agricultural practices and credit requirements of its regions. The distribution and utilization of institutional credit show marked differences across states and regions.

1. Northern Plains (Punjab, Haryana, Uttar Pradesh, Bihar)

- **Agricultural Characteristics:** The northern plains are characterized by fertile alluvial soils, extensive canal networks, and a high level of mechanization, making them the agricultural powerhouses of India. Crops like wheat, rice, and sugarcane dominate the region.
- **Credit Utilization:** Punjab and Haryana have high credit penetration due to a robust network of commercial banks and cooperatives. Institutional credit has enabled widespread adoption of mechanized farming and irrigation infrastructure, significantly boosting productivity. However, in states like Bihar, institutional credit penetration is relatively low, leading to underutilization of resources and lower productivity.

2. Western Region (Rajasthan, Gujarat, Maharashtra)

- **Agricultural Characteristics:** This region has a mix of arid and semi-arid conditions, with limited water availability and reliance on rainfed agriculture in large areas. Crops like cotton, millets, and oilseeds are common.
- **Credit Utilization:** Institutional credit has been instrumental in financing drip irrigation, water conservation techniques, and cash crop cultivation in states like Gujarat and Maharashtra. Rajasthan, however, faces challenges in accessing credit due to sparse bank networks and a high percentage of small and marginal farmers.

3. Southern Region (Tamil Nadu, Karnataka, Andhra Pradesh, Kerala)

- **Agricultural Characteristics:** The southern states are known for diverse cropping systems, including paddy, spices, plantation crops, and horticulture. The presence of extensive irrigation networks, such as the Krishna and Cauvery River basins, supports agriculture in many areas.
- **Credit Utilization:** These states have a relatively high penetration of institutional credit, driven by cooperative banks and Regional Rural Banks

(RRBs). Credit has facilitated the growth of allied activities like dairy farming and fisheries, particularly in coastal and water-abundant regions.

4. Eastern Region (West Bengal, Odisha, Assam, and Northeastern States)

- **Agricultural Characteristics:** This region experiences high rainfall, making it suitable for paddy cultivation and jute farming. However, fragmented landholdings and traditional farming practices often limit productivity.
- **Credit Utilization:** Institutional credit penetration in the eastern region, especially in the northeastern states, remains low. Factors like difficult terrain, sparse bank networks, and lack of financial literacy hinder credit access. Targeted initiatives like SHGs and microfinance have started to bridge the gap, but the impact remains limited.

5. Central and Plateau Region (Madhya Pradesh, Chhattisgarh, Jharkhand)

- **Agricultural Characteristics:** Predominantly rainfed agriculture with crops like wheat, pulses, and coarse grains. The region also has significant forest cover, impacting land availability for farming.
- **Credit Utilization:** Institutional credit has supported watershed management projects and soil conservation efforts in states like Madhya Pradesh. However, credit access in Jharkhand and Chhattisgarh is constrained by poverty and infrastructural deficits.

Challenges in Regional Credit Distribution

1. **Banking Infrastructure:** The presence of bank branches is uneven across regions, with better coverage in agriculturally advanced states like Punjab and Tamil Nadu and limited reach in northeastern and tribal-dominated areas.
2. **Land Ownership Patterns:** In regions with high tenancy rates and fragmented landholdings, like Bihar and Jharkhand, lack of collateral restricts access to institutional credit.
3. **Diverse Credit Needs:** Different regions require credit for distinct purposes, such as mechanization in the north, irrigation in the west, and diversification in the south. A one-size-fits-all approach to credit allocation often leads to inefficiencies.
4. **Natural Disasters and Climate Variability:** Regions prone to floods (e.g., Assam, Bihar) or droughts (e.g., Rajasthan, Maharashtra) face higher risks in agricultural credit. This often leads to higher non-performing assets (NPAs) and reduced willingness of banks to lend.

Geographical Success Stories in Institutional Credit

1. **Punjab and Haryana:** The Green Revolution transformed these states into agricultural hubs, largely due to the effective use of institutional credit for mechanization, HYV

seeds, and irrigation. Today, these states boast the highest per capita credit disbursement for agriculture in India.

2. **Gujarat:** Gujarat's success in promoting cash crops like cotton and groundnut is a testament to effective credit utilization. The government's support for micro-irrigation and financial assistance programs has significantly enhanced agricultural output.
3. **Kerala:** Institutional credit has played a crucial role in supporting Kerala's plantation economy, particularly for crops like spices, rubber, and tea. Cooperative banks and RRBs have been instrumental in this success.

Strategies for Balanced Geographical Credit Distribution

1. **Strengthening Regional Rural Banks (RRBs):** Expanding the reach and capacity of RRBs in underserved regions, particularly in the northeast and tribal areas, can improve credit penetration.
2. **Customized Credit Products:** Designing region-specific credit schemes, such as loans for water-saving techniques in arid areas or support for jute farmers in the east, can address unique regional needs.
3. **Digital Financial Inclusion:** Promoting mobile banking, online credit platforms, and e-KYC in remote areas can overcome geographical barriers and make credit accessible to marginalized farmers.
4. **Government Intervention:** Policies like interest subvention for specific regions, crop insurance linked to credit, and targeted lending quotas can encourage banks to focus on underserved areas.
5. **Capacity Building:** Enhancing financial literacy among farmers, particularly in low-credit regions, can empower them to access institutional credit effectively.

Conclusion

Institutional credit has been a vital driver of agricultural transformation in India, significantly enhancing productivity, supporting rural livelihoods, and promoting sustainability. As the nation confronts challenges like a growing population, resource scarcity, and climate change, the need for accessible and efficient agricultural credit is more urgent than ever. A geographical analysis of credit distribution reveals stark regional disparities, with some states leveraging credit effectively to boost productivity while others struggle due to infrastructural and socio-economic constraints. Addressing these imbalances through equitable credit allocation and tailored financial solutions is crucial for fostering inclusive agricultural growth. By focusing on region-specific needs and implementing innovative strategies, institutional credit can bridge regional gaps, unlock the full potential of India's agricultural sector, and lay the foundation for a sustainable and prosperous future.

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