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REVIEW ARTICLE

DETERMINANTS INFLUENCING INSTITUTIONAL AGRICULTURAL CREDIT FLOW: A COMPREHENSIVE REVIEW

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Abstract: The institutional agricultural credit is vital for enhancing farm productivity and economic growth. This review paper comprehensively analyzed 60 studies covering the period 1995-2024 from India and other countries, categorizing demand-side and supply-side determinants of credit flow. The study classified literature by year, country, data and publication sources, identifying key trends and research gaps. The review paper highlighted the dominance of secondary data and a strong post-reform focus. The study also revealed underexplored supply-side factors affecting credit distribution. Further, the review study suggested strengthening the institutional frameworks, simplifying the application procedures, increasing bank branches, bank extension services, in rural areas, training to farmers and integrating global best practices to enhance India's agricultural credit system. This review study provided insights for future research and policy reforms to ensure inclusive and efficient credit access to the farmers.

Keywords: *Institutional agricultural credit, Farm productivity, Economic growth, Demand-side determinants, Supply-side determinants.*

JEL Classification: Q14, Q11, O40, Q11, Q11

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INTRODUCTION

India's agriculture is highly diverse, with performance differing significantly across regions, states, and farming sectors. The agriculture and allied sector has been a key pillar of the Indian economy, significantly contributing to national income and employment. This sector accounts for around 16% of the country's GDP (at current prices) and provides livelihoods for approximately 46.1% of the population. India's agriculture sector has grown steadily, averaging 5% annually from 2017 to 2023 (Economic Survey 2024-25).

The three key drivers of agricultural growth are the enhanced use of inputs, technological advancements, and improvements in technical efficiency [Das et al., 2009]. Indian agriculture has always been highly dependent on monsoons, making it a naturally risk-prone activity [Mohan, 2006]. Further, agriculture requires a significant initial capital investment and involves a time lag between spending and revenue generation [Shiva swamy et al., 2020]. Agricultural credit is a vital input for India's agriculture sector, given its significant role in the macroeconomic framework and poverty alleviation [Mohan, 2006]. Credit is a vital empowerment tool that can uplift individuals from poverty, enhance self-worth, and boost productivity, especially among farmers [Akudugu, 2012]. Credit flow to agriculture is limited by factors like high transaction costs, structural deficiencies, creditworthiness issues, lack of collateral, small loan sizes with higher risks, high manpower requirements, etc. [Golait, 2007].

Hence, sufficient credit support for all farmers, particularly small and marginal farmers and vulnerable groups, is essential for enhancing agricultural productivity and income. Many institutional agencies such as Cooperatives, Regional Rural Banks (RRBs),

Scheduled Commercial Banks (SCBs), Non-Banking Financial Institutions (NBFIs), and

Self-Help Groups (SHGs) play a vital role in providing financial support to the agricultural sector [Nithin, 2016]. The failure of formal credit institutions to fulfill existing credit demand has resulted in a greater dependence on informal sources for short-term credit [Durojaiye et al., 2014]. One of the key objectives of the credit policy is to reduce the dependence on non-institutional sources, particularly moneylenders, in the distribution of agricultural credit [Kumar et al., 2007].

The literature investigated that the determinants impacting institutional credit can be broadly divided into two categories, i.e. demand-side determinants and supply-side determinants as represented in Table 2 and Table 3 respectively. This review paper synthesized existing research, identified gaps, and provided a structured understanding of determinants, categorized in demand-side and supply-side factors in agricultural credit. The studies were collected for review where institutional agricultural credit was taken as a dependent variable which was binary in nature.

The review undertook systematic work of collection of determinants influencing credit flow and shared the econometric models that estimated significant relationships among variables. Hence, this manuscript investigated for a clearer analysis of institutional policies (supply) and farmer behavior (demand) influencing credit accessibility. This structured approach enhances policy recommendations, ensuring targeted interventions that improve financial inclusion and agricultural productivity.

This review paper is organized as follows. The second section provides the background, covering the history and key measures to improve agricultural credit in India. The third section, rationale and scope, explains the importance of credit, its determinants, and its policy implications. The fourth section, objectives, outlines the study's focus on credit trends, challenges, and institutional roles.

The fifth section, literature categorization, classifies studies by year, country, data-source, etc. The sixth section, results and discussion, presents key findings with supporting data and tables.

The seventh section, conclusion and policy implications, summarizes insights and recommendations.

Background

The history of agricultural credit in India dates back to the early 20th century when farmers primarily relied on moneylenders, often facing exorbitant interest rates and debt traps. The first institutional intervention came with the Cooperative Credit Societies Act of 1904, which laid the groundwork for cooperative banking. After independence, the Reserve Bank of India (RBI) took significant steps to strengthen rural credit by promoting cooperative banks and encouraging commercial banks to extend agricultural loans.

A major turning point came with the nationalization of banks in 1969, which mandated lending to priority sectors, including agriculture. This paved the way for the establishment of key institutions such as the National Bank for Agriculture and Rural Development (NABARD) in 1982, which played a vital role in refinancing rural banks [Mohan, 2006]. Over time, initiatives like the Kisan Credit Card (KCC) scheme (1998) and interest subvention schemes further improved access to agricultural credit.

Today, a wide network of commercial banks, regional rural banks (RRBs), and cooperative institutions cater to the short-term and long-term financial needs of farmers. India followed a supply led approach for agricultural credit growth hence several key milestones have shaped institutional credit in India including the Rural Credit Survey Committee Report (1954), nationalization of major banks (1969 & 1980), the establishment of RRBs (1975) and NABARD (1982), financial sector reforms (1991 onwards), the introduction of the Special Agricultural Credit Plan (1994-95), the launch of Kisan Credit Cards (1998-99), the Doubling Agricultural Credit Plan (2004), and the Agricultural Debt Waiver and Debt Relief Scheme in 2008 [31,50].

These measures have significantly improved the flow of credit to the agricultural sector. More recent initiatives, such as the Modified

Interest Subvention Scheme (MISS), Adjusted Net Bank Credit (ANBC), Prompt Repayment Incentive (PRI), and Kisan Rin Portal, continue to enhance financial support for farmers (Economic Survey 2024-25).

Rationale and Scope of the Study

Institutional agricultural credit is a critical driver of farm productivity, rural development, and financial inclusion. Access to institutional credit enables farmers to adopt improved technologies, enhance input use, and manage risks associated with price volatility and climatic uncertainties.

However, despite the presence of structured financial institutions, many farmers-particularly smallholders-face significant barriers to accessing credit due to collateral constraints, procedural complexities, and information asymmetries. A systematic examination of the determinants influencing the flow of institutional agricultural credit is, therefore, essential for identifying bottlenecks and facilitating more efficient and equitable credit allocation.

These determinants have direct implications for policy formulation and financial sector reforms. Analyzing the factors affecting credit supply and demand can help policymakers design targeted interventions that improve credit accessibility, streamline lending procedures, and mitigate risks for both lenders and borrowers. Moreover, as agriculture faces increasing challenges related to climate change and resource sustainability, the role of institutional credit in supporting resilience-oriented investments is gaining prominence. A well-functioning credit system not only enhances agricultural productivity but also contributes to broader economic stability by integrating smallholders into formal financial networks.

This review paper examines the determinants of institutional agricultural credit flow from both supply-side and demand-side perspectives. Supply-side factors include interest rates, inflation rate, application procedure of financial institutions, regulatory policies, and institutional credit extension processes.

On the demand side, key determinants encompass age, education, gender, family size, farm size, income levels, distance from the bank branch, number of bank branches etc.

By synthesizing insights from 60 empirical studies, this review aims to provide a comprehensive understanding of the structural and operational dynamics influencing agricultural credit flow. The findings will offer valuable insights for policymakers, financial institutions, and researchers, supporting the development of evidence-based strategies to enhance credit accessibility, efficiency, and long-term agricultural sustainability.

Objectives of the Study

The objective of this study is to comprehensively analyze the determinants influencing institutional agricultural credit flow by reviewing and synthesizing research conducted across various countries, beyond India. By systematically examining approximately 60 studies, this manuscript categorizes and evaluates both demand and supply-side factors separately, ensuring a structured understanding of their impact on credit accessibility and agricultural productivity.

The study further categorizes research based on the source of publication, country, and year to assess geographical and institutional variations in scholarly contributions. Moreover, it evaluates the sources of data collection used in different studies to understand methodological patterns and reliability. Through this classification, the study aims to identify gaps in the existing literature by assessing which factors have been extensively studied and which remain underexplored. This approach allows for a deeper insight into overlooked determinants that may significantly influence agricultural credit flow.

By integrating diverse methodologies and findings from global research, the study will provide valuable insights for scholars to explore new research directions. Additionally, it will offer policymakers a more informed perspective on the institutional and structural challenges affecting agricultural credit distribution, ultimately aiding in the formulation of policies that enhance financial access and agricultural growth.

CATEGORIZATION OF LITERATURE

After examining 60 papers, the literature was systematically classified into following four categories.

Year Based Studies

Fig.1 represented the year-wise classification of studies which ranged from 1995 to 2024, with the highest number of studies reviewed from 2020 (8) followed by significant contributions in 2022 (7), 2014 (5), 2015 (4), 2016 (4), 2023 (3) and 2024 (3). Notably, most of the reviewed literature was from the post-2000 period, marking a strong focus on the post-reform era.

Studying the post-reform period was crucial because it captured the structural and policy shifts that had significantly influenced institutional agricultural credit flow. Economic reforms, financial liberalization, and agricultural policy changes had reshaped the credit landscape, impacting both access to and the distribution of institutional credit. Hence, analyzing this period allowed for a better understanding of how policy interventions, banking reforms, and institutional frameworks have evolved to support or hinder agricultural finance.

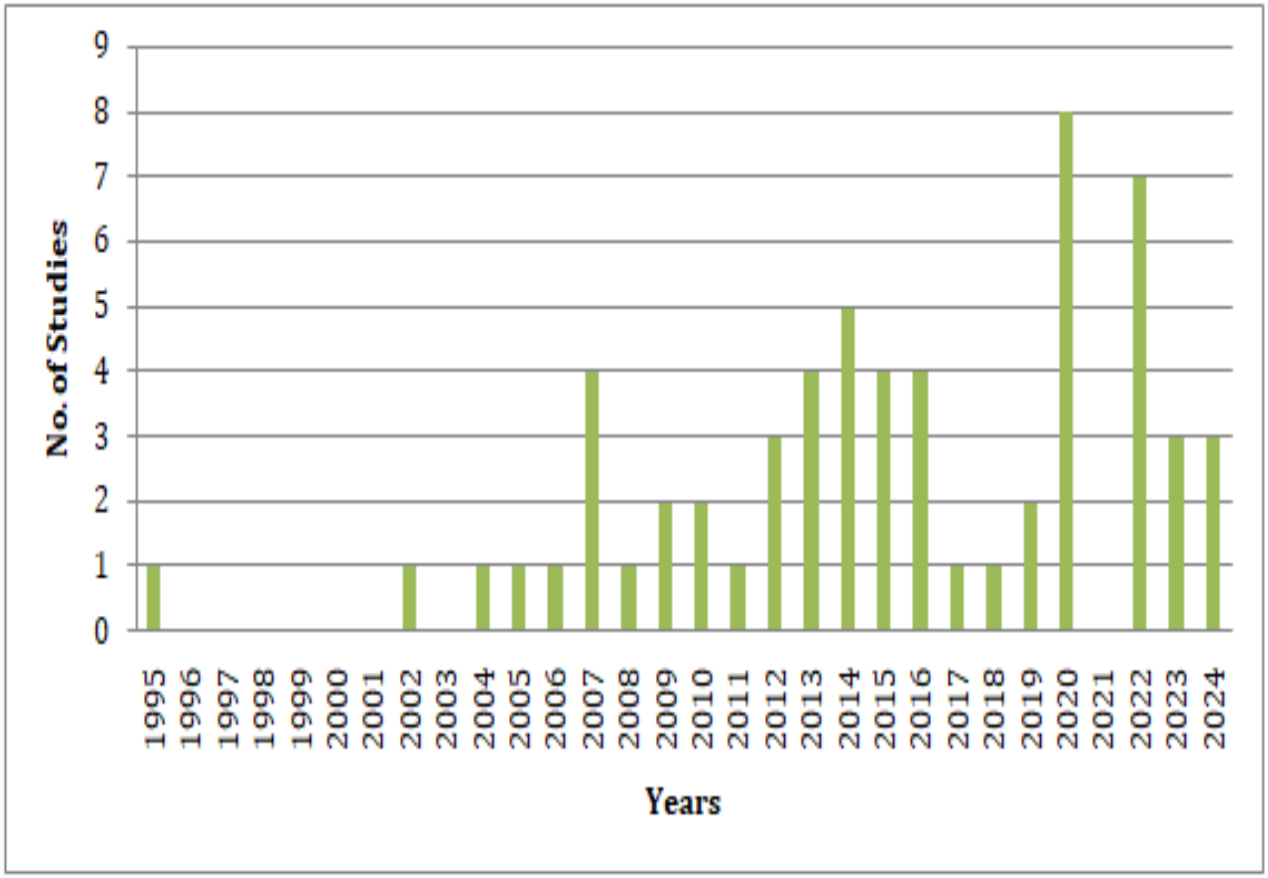

Fig.1. Year-wise studies

Country Based Studies

Fig. 2 illustrated the categorization of studies based on the country distribution, showing that the majority-46 out of 60-are from India, while the remaining studies are from Nigeria (6), Bangladesh, Ghana, Ethiopia, South Africa, and Indonesia. The strong emphasis on Indian studies reflected the country's significant reliance on institutional agricultural credit and the extensive research conducted on this subject in the Indian context. This focus on India is crucial as it provides a deep understanding of the challenges and opportunities in the country's agricultural credit system. Additionally, integrating insights from international studies allowed for comparative analysis, helping India adopt successful global practices.

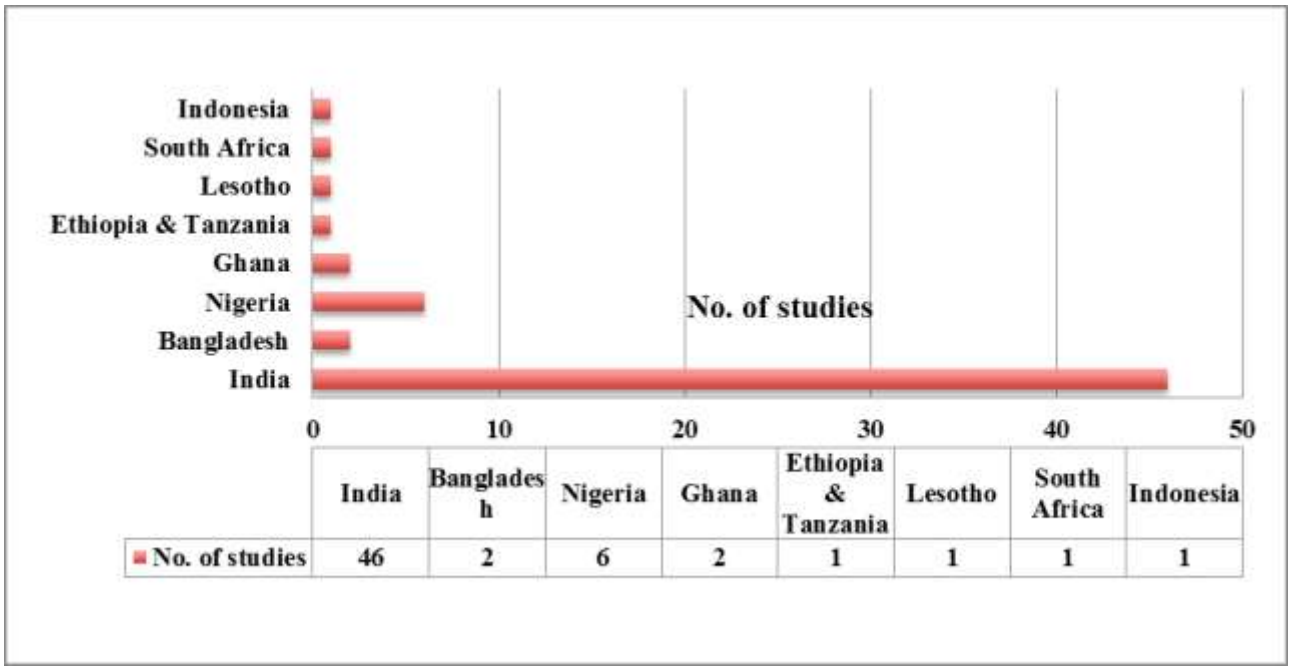

Fig. 2: Country-wise studies

Data-Source Based Studies

Fig. 3 depicted the categorization of collected studies based on data sources. Among the 60 studies analyzed, 15 were based on primary data, 32 relied on secondary data sources, and 13 incorporated both primary and secondary data. This highlighted that secondary data sources had been given the highest priority in the reviewed literature, reflecting their widespread availability and relevance in current research. However, the inclusion of both primary and mixed-method studies ensured a comprehensive understanding of agricultural credit determinants.

This analysis underscored the importance of secondary data in the present scenario, given its accessibility, broader coverage, and potential for trend analysis. At the same time, primary data remained crucial for capturing real-time insights and context-specific issues. By integrating both sources, this study provided a well-rounded perspective, enhancing its relevance for policymakers and researchers in understanding agricultural credit flow dynamics.

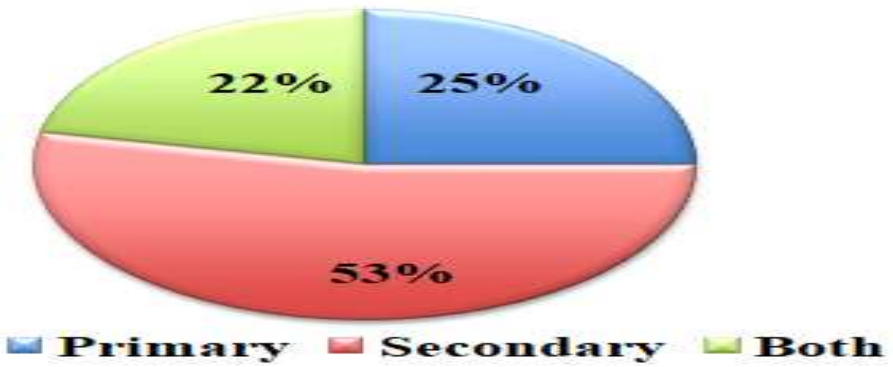

Fig. 3: Sources of data collection

Publication-Source Based Studies

Table 1 presented the list of journals from both India and international sources. The most frequent sources of publications are from Agricultural Economics Research Review (6), followed by Indian Journal of Agricultural Economics (4), etc. Hence, the comprehensive coverage of journals ensured the balancing of local insights with global perspectives and provided deeper understanding of agriculture credit and related aspects.

Table 1: Publication-source based studies

Name of Journal	*Number of studies*
Abhinav journal	*1*
Advances in Life Sciences	*1*
African Journal of Agricultural Research	*1*
Agricultural Economics Research Review	*6*
Agricultural Economics Review	*1*
Agricultural Economics	*1*
American Journal of Experimental Agriculture	*1*
Asian Journal of Agriculture and Rural Development	*1*
BSSS Journal of Commerce	*1*
Development Southern Africa	*1*
Economic and Political Weekly	*1*
European Journal of Business and Management Research	*1*
GAU Research Journal	*1*
Global Journal of Science Frontier Research Agriculture and Veterinary Sciences	*1*
Indian Journal of Agricultural Economics	*4*
Indian Journal of Agricultural Sciences	*1*
Indian Journal of Economics and Development	*1*
Institute for Social and Economic Change	*1*
International Journal of Academic Research and Development	*2*
International Journal of Creative Research Thoughts (IJCRT)	*1*
International Journal of Current Microbiology and Applied Sciences	*1*
International Journal of English Literature and Social Sciences	*1*
International Journal of Multidisciplinary Research and Development	*1*
International Journal of Multidisciplinary Research in Science, Engineering and Technology	*1*
International Journal of Recent Technology and Engineering	*1*
International Journal of Research in Management & Social Science	*1*
International Journal on Advanced Science, Engineering and Information Technology	*1*
International Research Journal of Business Studies	*1*
Journal of Agricultural Studies	*1*
Journal of Agriculture and Food Research	*1*
Journal of Agriculture and Social Research	*1*
Journal of Development and Agricultural Economics	*1*
Journal of Economic Policy and Research	*1*
Journal of Emerging Technologies and Innovative Research	*1*
Journal of Pharmacognosy and Phytochemistry	*1*
Journal of Rural Development	*2*
Journal of Sustainable Development in Africa	*1*
Munich Personal RePEc Archive (MPRA)	*1*
Ramanujan International Journal of Business and Research	*2*
Research Journal of Agriculture and Forestry Sciences	*1*
Reserve Bank of India Occasional Papers	*2*
SDMIMD Journal of Management	*1*
Social Science Research Network	*1*
Sustainability MDPI	*1*
The Journal of Rural and Agricultural Research	*1*
World Development	*1*
International Journal of Current Research and Academic Review	*1*

RESULTS AND DISCUSSIONS

The institutional credit accessibility to the agricultural sector had been extensively analyzed in the reviewed literature, where studies had broadly classified the determinants into two categories: demand-side and supply-side factors. These determinants had been systematically presented in Table 2 and Table 3, respectively. The studies predominantly employed institutional agricultural credit as a dichotomous dependent variable, operationalized as a binary choice model.

This implied that the credit access outcome could assume only two values: 1 if accessed and 0 if not accessed. However, the independent variables considered in these studies encompassed continuous, discrete and categorical nature of variables. To examine the factors influencing institutional credit access, various econometric models as presented in fig. 4, had been applied. Among the most commonly utilized models were the Tobit model [Akudugu, 2012; Balana et al., 2022; Kumar et al., 2010], Logit model [Elias et al., 2015; Yeasmin et al., 2024], Multinomial Logit model [Durojaiye et al., 2014; Kumar et al., 2007], Binomial Logit model [Rahman et al., 2022], Binary Logistic Regression (BLR) model [Jatav & Nayak, 2022], Binomial Logistic Regression model [Ololade & Olagunju, 2013], Cragg's Double-Hurdle model [Akpan et al., 2013; Balana et al., 2022], Multivariate Regression Analysis [Rawat et al., 2020], Multiple Regression Analysis [Olaoye et al., 2011], Probit model [Karthick & Madheswaran, 2020; Yadav & Rao, 2020], Multinomial Probit model [Balana et al., 2022], Conditional Probit model [Kumar et al., 2015], Probit Regression model [Kumar & Bhatt, 2016]. In addition to these, Discriminant Analysis [Gandhimathi & Vanitha, 2010], the inverse Mills ratio was employed in some studies to address potential selection bias. Several models assumed credit access as a log-linear function, as evidenced in the works of Jatav and Nayak (2022) as well as Rawat et al. (2020).

Furthermore, other advanced econometric techniques were implemented to enhance the robustness of the findings. For instance, the fixed effects model was applied by Sinha and Kundu to control for unobserved heterogeneity, while McFadden's choice model was utilized by Kumar et al. (2015). Additionally, the joint maximum likelihood procedure, as proposed by Heckman, was employed to analyze both the probability of credit access and the corresponding amount of credit availed by farmers.

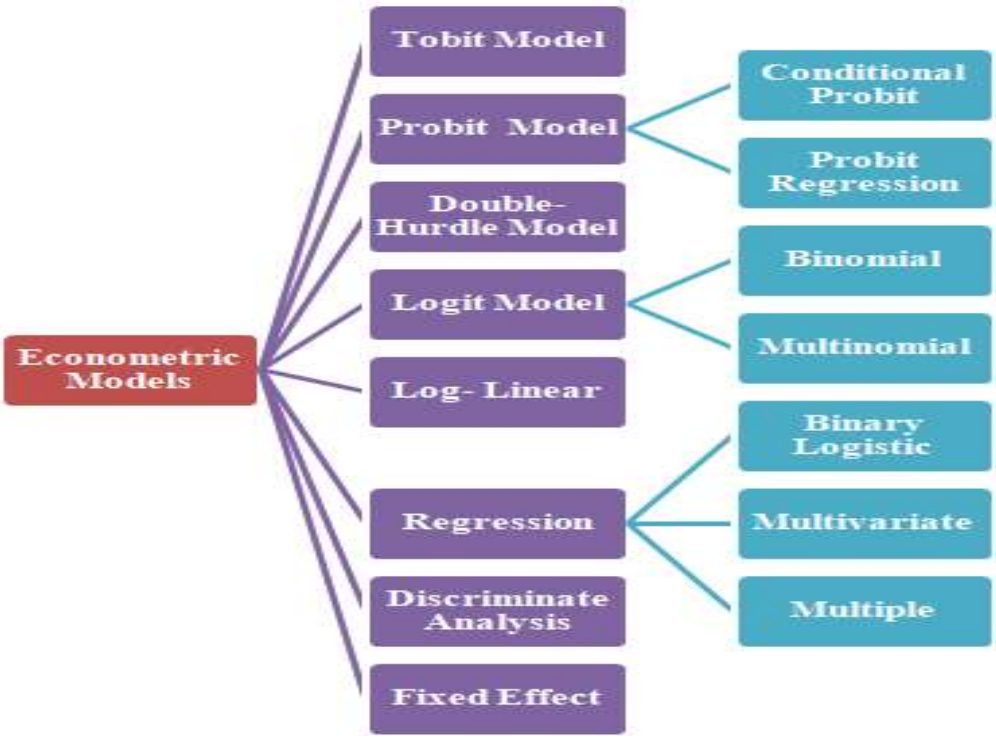

Fig.4. Econometric models applied in studies

Demand-Side Factors

Socio-Demographic Factors

The reviewed literature extensively examined socio-demographic determinants of institutional agricultural credit access, including variables such as age, squared age (age^2), gender, literacy, household size, and social group. Several studies highlighted that younger farmers were more likely to rely on informal credit sources, whereas institutional credit accessibility increased with the age of the household head due to greater experience and enhanced decision-making abilities [Jatav & Nayak, 2022; Karthick & Madheswaran, 2020; Kumar et al., 2015].

However, the squared age variable (age^2) exhibited a negative relationship with credit access, as financial institutions often impose constraints on older individuals, considering their reduced economic longevity and potential repayment risks [Kumar & Bhatt, 2016].

With respect to gender, some studies found that female-headed households had higher accessibility to institutional credit compared to their male-headed counterparts [Kumar et al., 2015]. However, contrary evidence suggested that men were more likely to obtain credit than women [Elias et al., 2015], indicating discrepancies across studies. Literacy levels were found to positively influence access to institutional credit, as educated farmers demonstrated a higher propensity to engage with formal credit institutions [Elias et al., 2015; Jatav & Nayak, 2022]. Household size exhibited a negative but significant relationship with institutional credit access, suggesting that as household size increased, access to credit declined [Elias et al., 2015; Kumar et al., 2010].

The influence of social group on credit access varied across studies. In general, farmers from the general category had greater access to institutional credit compared to those belonging to Other Backward Classes (OBC) and Scheduled Castes (SC). However, Scheduled Tribes (ST) were found to have higher credit accessibility than the general category in some studies [Yadav & Rao, 2020]. Conversely, other studies reported that ST households had lower access to institutional credit than their general category counterparts [Karthick & Madheswaran, 2020]. Factors such as training and marital status were explored in the literature but were found to have relatively less significance in influencing institutional credit access.

Economic Factors

Agriculture played a crucial role in the economic structure of the region, significantly contributing to the agricultural Gross Domestic Product (GDP). The intensity of agricultural land use had a positive impact on the flow of institutional credit, as observed in the studies by Sinha and Kundu (2020). Also, higher agricultural land utilization indicated greater engagement in farming activities, thereby enhancing the demand and eligibility for credit.

While reviewing the collected studies, several economic factors were found to positively and significantly affect credit flow, including household expenditure, family income, farm size, irrigation intensity, and the availability of irrigation facilities [Elias et al., 2015; Yadav & Rao, 2020]. Larger farm sizes and improved irrigation infrastructure increased the productivity and profitability of farming, making farmers more creditworthy in the eyes of financial institutions. Occupational background also influenced credit access, with individuals engaged in all types of occupations having lower access to institutional credit compared to households with regular salaried earnings. However, occupational experience was observed to have a favorable impact on credit accessibility, as experienced farmers demonstrated better financial management and repayment capacity [Yeasmin et al., 2024].

Livestock ownership and household assets were among the most important economic factors analyzed in the reviewed studies. Livestock holdings were particularly associated with improved repayment capacity, indicating that households with greater livestock assets were better positioned to secure and repay institutional credit [Kumar & Bhatt, 2016]. Some economic factors had a less prominent yet noteworthy impact on credit access. For instance, life insurance coverage was found to positively influence credit availability, as insured individuals were perceived as lower-risk

borrowers by financial institutions. Conversely, the number of earning members per household had an inverse but significant relationship with institutional credit accessibility, as households with multiple income sources tended to rely more on their pooled funds rather than seeking external credit [Yeasmin et al., 2024].

Additionally, factors such as cost of production, credit utilization, and bank account ownership had a positive and significant effect on credit access. An increase in labor costs and farm size leads to higher production expenses, necessitating greater capital investment. This, in turn, increases the demand for credit to sustain agricultural operations [Akpan et al., 2013]. A study by Gandhimathi & Vanitha found that medium-sized farmers received higher loan sanctions, highlighting the role of farm size in credit allocation.

Furthermore, the study observed that cropping patterns influenced credit disbursement, with dominant crops in the region receiving greater financial support. Cash crops and their influence on institutional credit accessibility were also examined in several studies, indicating that farmers cultivating commercial crops often had higher access to credit due to their potential for higher returns and profitability.

Institutional Factors

The collected studies revealed that lending rates, inflation rates, and complex application procedures negatively affected credit demand, with their impact being statistically significant at the 1% level.

This finding suggested that an increase in both lending and inflation rates led to a decline in the demand for institutional credit [Kumar & Bhatt, 2016; Sinha & Kundu, 2020; Yeasmin et al., 2024]. The requirement for frequent bank visits had a negative and significant effect, as farmers were compelled to visit branches multiple times, leading to delays in loan disbursement. Consequently, this procedural inefficiency inclined them toward informal credit sources [Yadav & Rao, 2020].

Further, Social extension services exhibited a positive impact, indicating that farmers with better access to extension agents and social networks had improved credit access. This was primarily due to their ability to leverage these contacts for guidance and assistance in securing institutional loans [Yadav & Rao, 2020]. Collateral availability also demonstrated a positive relationship with institutional credit access, reflecting lower default probabilities and increased lender confidence.

Furthermore, cooperative membership was positively but insignificantly associated with institutional credit access. This insignificance likely stemmed from the cooperative structure, where the group collectively acted as a guarantor for loan repayment, reducing individual risk but not necessarily enhancing access to credit [Kumar & Bhatt, 2016].

Geographical Factors

Key geographical factors indicated that western states in India had high accessibility to the institutional credit because of cooperative movement [Karthick & Madheswaran, 2020]. On contrary the study by Shiva swamy et al. found that southern states accessed more credit followed by northern states and eastern, western, north-eastern states was disbursed lower amount of credit. The availability and distribution of rural credit are skewed, favoring regions with better resources and infrastructure [Das et al., 2009; Kumar et al., 2007].

Environmental Factors

Households situated in agro- economic zones like irrigated regions exhibited a greater likelihood of securing credit from institutional sources in comparison to households residing in coastal areas. Conversely, households in other geographic regions demonstrated a lower propensity to utilize institutional financing options [Kumar et al., 2010].

Table 2: Demand- side determinants influencing institutional agricultural credit flow

Socio-demographic factors	
Variable	**Nature**
Age	Continuous
Age^2	Continuous

Gender	Binary (Male=1, Female=0)
Literacy level	
Primary	Binary (Yes=1, Otherwise=0)
Secondary	Binary (Yes=1, Otherwise=0)
Higher Secondary	Binary (Yes=1, Otherwise=0)
Graduate and above	Binary (Yes=1, Otherwise=0)
Caste group	
SC	Binary (Yes=1, Otherwise=0)
ST	Binary (Yes=1, Otherwise=0)
OBC	Binary (Yes=1, Otherwise=0)
Marital status	Binary (Married=1, Otherwise=0)
Household size	Continuous
Farming experience	Continuous
Economic Factors	
Variable	**Nature**
Farm size	Continuous
Income of the family	Continuous
Source of income	
Farm income	Binary (Yes=1, Otherwise=0)
Off-farm income	Binary (Yes=1, Otherwise=0)
Earning hands per family	Discrete
Household expenditure per annum	Continuous
Household assets	Continuous
Irrigation intensity	Continuous
Irrigation facility	Binary (Yes=1, No=0)
Number of land fragments per farm	Discrete
Occupation	
Agriculture labour	Binary (Yes=1, Otherwise=0)
Other labour	Binary (Yes=1, Otherwise=0)
Self- employed in agriculture	Binary (Yes=1, Otherwise=0)
Other	Binary (Yes=1, Otherwise=0)
Livestock	Discrete
Cash crop	Binary (Grown=1, Otherwise=0)
Credit utilization	Binary (Yes=1, Otherwise=0)
Cost of production	Continuous
Bank accounts	Binary (Has=1, Otherwise = 0)
Life insurance	Binary (Yes=1, Otherwise= 0)

Table 2: Demand- side determinants influencing institutional agricultural credit flow

Institutional factors	
Variable	**Nature**
Lending rate	Continuous
Inflation rate	Continuous
Interest rate	Continuous
Complicated procedures	Binary (Yes=1, Otherwise=0)
Collateral requirements	Binary (Yes=1, Otherwise=0)
Savings	Binary (Yes=1, Otherwise=0)
Default on loan repayment	Binary (Yes=1, Otherwise=0)
Distance	Continuous
Bank visits	Continuous
Received any formal training	Binary (Yes=1, Otherwise=0)
Took any technical advice	Binary (Yes=1, Otherwise=0)
Access to extension services	Binary (Yes=1, Otherwise=0)
Geographical factors	
Variable	**Nature**

North	Binary (Yes=1, Otherwise=0)
South	Binary (Yes=1, Otherwise=0)
East	Binary (Yes=1, Otherwise=0)
West	Binary (Yes=1, Otherwise=0)
North- East	Binary (Yes=1, Otherwise=0)
Environmental factors	
Variable	**Nature**
Agro- ecological zone	
Arid	Binary (Yes=1, Otherwise=0)
Coastal	Binary (Yes=1, Otherwise=0)
Hill and Mountain	Binary (Yes=1, Otherwise=0)
Rainfed	Binary (Yes=1, Otherwise=0)
Political factors	
Variable	**Nature**
Government policies (MSP, KCC, Ration card, MGNREGA job card)	Binary (Yes=1, Otherwise=0)
Political status	Binary (Yes=1, Otherwise=0)
Membership of Co-operatives	Binary (Yes=1, Otherwise=0)

Political Factors

Government policies, political status, and cooperative membership positively and significantly impacted credit accessibility by reducing financial barriers, improving borrower credibility, and fostering institutional support. Policies like Kisan Credit Card etc. provided subsidies, political influence boosts trust, and cooperatives offer collective bargaining [Kumar & Bhatt, 2016], collateral alternatives, and financial literacy, ensuring better loan access.

Supply-Side Factors

The agricultural credit disbursement target had a positive and significant impact at a 1% level. Despite a slight increase in credit supply with rising NPLs, banks aimed to minimize NPLs to secure deposits. An inverse relationship was observed between manpower and agricultural credit supply. Credit supply also increased with the severity of natural disasters, as local shocks drove credit demand [Yeasmin, 2024]. The key determinants of agricultural credit supply were investment profitability, farmer assets, interest rates, credit availability, transaction costs, and risk-bearing capacity, with credit availability being the most crucial and transaction costs the least significant [Okerenta & Orebiyi, 2005]. Further, political interference had impacted credit supply negatively as concerns showed by managers during interviews [Akudugu, 2012].

Table 3: Supply- side determinants influencing institutional agricultural credit flow

Variable	Nature
Percentage of irrigated area to gross cropped area	Continuous
Percentage of area under commercial crops to gross cropped area	Continuous
Credit-deposit ratio	Continuous
Density of bank branches per 1000 farmers	Continuous
Political interference	Categorical
Savings	Binary (Y/N)
Agricultural credit disbursement target	Continuous
Agricultural credit recovery amount	Continuous
Non-performing loan amount	Continuous
Amount of bank deposits	Continuous
Total bank branches	Discrete
Bank profit per year	Continuous
Severity of natural disaster	Continuous

Total Manpower in banking sector	Discrete
Availability of credit	Binary (Y/N)
Level of assets of the borrower	Continuous
Loan transaction cost	Continuous
Level of risk bearing	Continuous

CONCLUSION AND POLICY RECOMMENDATIONS

The analysis of existing studies revealed that supply-side determinants of institutional agricultural credit had been studied less compared to demand-side factors. Most research had focused on farmers' access to credit affected by various socio-demographic, economic factors, borrowing behavior, and challenges related to collateral and interest rates, while aspects such as financial institutions' lending policies, risk assessment mechanisms, extension services and regulatory constraints remained underexplored.

A balanced review required more attention to supply-side factors to provide a comprehensive understanding of the credit ecosystem. Financial inclusion played a crucial role in bridging the gap between demand and supply, making it essential to examine both perspectives. Future research needed to address structural limitations within financial institutions, assess regulatory frameworks, and explore innovative credit models to enhance accessibility and efficiency in agricultural finance.

The expansion of agricultural credit outreach requires the simplification of loan procedures and the equitable distribution of credit, particularly in deficit regions. The accessibility of formal credit remains limited due to procedural complexities, collateral requirements, and socio-economic factors such as education, caste, and gender. Financial literacy programs have been found to enhance borrowers' ability to navigate credit systems and improve their access to institutional credit.

However, nepotism and political biases in credit allocation continue to restrict fair distribution, highlighting the need for transparent mechanisms. The demand for credit increases during natural disasters, which indicates the necessity for adaptive financial solutions to support farmers during crises. Small and marginal farmers, who constitute a large share of total operational landholdings, require targeted credit interventions. Therefore, linking agricultural credit to essential inputs is necessary to further enhance productivity and strengthen farm performance.

Hence, simplification of loan disbursement procedures is essential for improving farmers' access to institutional credit. Financial institutions should actively promote awareness regarding available credit facilities to ensure broader participation. The expansion of rural banking infrastructure is necessary, as establishing more bank branches in underserved areas can enhance credit outreach. Cooperative lending models should be encouraged to help farmers overcome collateral constraints and improve access to formal credit. Transparent policies must be implemented to eliminate political biases in credit allocation and ensure fair distribution.

The development of adaptive financial products, such as insurance-linked credit, can help mitigate risks associated with natural disasters and stabilize farmers' financial conditions. Technological advancements, including mobile banking and AI-driven credit scoring, should be leveraged to improve credit assessment and facilitate lending in remote agricultural regions. The government should take proactive steps to support livestock expansion, where diversification in agriculture can improve economic stability. Additionally, the availability of concessional loans for farmers should be prioritized to reduce financial burdens and promote sustainable agricultural growth. Hence, implementation of these measures will contribute to a more inclusive, efficient, and resilient agricultural credit system.

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REFERENCES

1. Asha S, Ramaswamy, M & Kumar SS (2024), "Impact of agricultural credit by commercial banks on agricultural GDP. *SDMIMD* Journal of Management, Vol. 15 No.2, pp. 69-85. https://doi.org/10.18311/sdmimd/2024/46225
2. Alexpandi, M & Rameshkumar, S (2014), "Utilisation and repayment of agricultural credit-the case of Madurai district, Tamil Nadu", Journal of Rural Development, Vol. 33 No. 2, pp. 147-159.
3. Ahangar, GB, Ganie, AH, Padder, MJ (2013), "A study on institutional credit to agriculture sector in India", International Journal of current research and academic review, Vol. 1 No.4, pp. 72-80.
4. Akudugu, M. A. (2012), "Estimation of the determinants of credit demand by farmers and supply by rural banks in Ghana's Upper East Region", Asian Journal of Agriculture and Rural Development, Vol. 2 No. 2, pp.189-200. http://dx.doi.org/10.22004/ag.econ.197959
5. Akpan, SB, Patrick, IV, Udoka SJ, Offiong EA, Okon UE (2013), "Determinants of credit access and demand among poultry farmers in Akwa Ibom State, Nigeria", American Journal of Experimental Agriculture, Vol. 3 No. 2, pp. 293-307. https://doi.org/10.9734/AJEA/2013/2810
6. Balana, BB, Mekonnen, D, Haile B, Hagos, F, Yimam, S & Ringler, C (2022), "Demand and supply constraints of credit in smallholder farming: Evidence from Ethiopia and Tanzania",World Development, 159, 106033. https://doi.org/10.1016/j.worlddev.2022.106033
7. Chauke, PK, Motlhatlhana, ML, Pfumayaramba, TK & Anim FDK (2013), "Factors influencing access to credit: A case study of smallholder farmers in the Capricorn district of South Africa", African Journal of Agricultural Research, Vol. 8 No.7, pp. 582-585. https://doi.org/10.5897/AJAR2013.6700
8. Chavan, R, Joshi, AT, Patil, SS & Hiremath, GM (2016), "Utilization pattern of agriculture crop loan by farmers in India with special reference to Karnataka", Indian Journal of Economics and Development, Vol. 4 No. 12, pp.1-6.
9. Das, A, Senapati, M & John J (2009), "Impact of agricultural credit on agriculture production: An empirical analysis in India", Reserve Bank of India Occasional Papers, Vol. 30 No. 2, pp. 75-107.
10. Durojaiye, AM, Yusuf, SA & Balogun, OL (2014), "Determinants of demand for microcredit among grain traders in Southwestern States", Nigeria. Journal of Agriculture and Veterinary Science, Vol. 7 No.11, pp.1-9. https://doi.org/10.9790/2380-071130109
11. Denkyirah, EK, Aziz, AA, Denkyirah, EK, Nketiah, OO & Okoffo, ED (2016), "Access to credit and constraint analysis: the case of smallholder rice farmers in Ghana", Journal of Agricultural Studies, Vol. 4 No. 2, pp.53-72. https://doi.org/10.5296/jas.v4i2.9167
12. Elias, S, Ahmad, IM & Patil, BL (2015), "The Determinants of access to agricultural credit for small and marginal farmers' in Dharwad district, Karnataka, India. Research Journal of Agriculture and Forestry Sciences, Vol. 3 No.5, pp. 01-05.
13. Gandhimathi, S & Vanitha, S (2010), "Determinants of borrowing behaviour of farmers - A comparative study of commercial and co-operative banks", Agricultural Economics Research Review, Vol. 23 No. 1, pp. 157-164. https://doi.org/10.22004/ag.econ.92163
14. Golait, R (2007), "Current issues in agriculture credit in India: An assessment", Reserve Bank of India occasional papers, Vol.28, No.1.
15. Harisha, BN (2018), "Institutional credit to agriculture in north eastern states: Problems and prospects", International Journal of Academic Research and Development, Vol. 3 No. 2, pp. 218-221.
16. Izhar, A & Tariq, M (2009), "Impact of institutional credit on aggregate agricultural production in India during post reform period", Munich Personal

RePEc Archive (MPRA), Paper No. 17075. https://mpra.ub.uni-muenchen.de/17075/

17. John, R, Kumar D & Ratnam S (2017), "Pattern of utilization of agricultural credits among KCC credit holding farmers of Allahabad District UP", International Journal of Academic Research and Development, Vol. 2 No. 3, pp. 21-23.
18. Joshi, N & Gautam, J (2014), "Inequalities in flow of agriculture credit: A macro and micro level analysis. Available at SSRN 2509898. https://doi.org/10.2139/ssrn.2509898
19. Jatav, SS & Nayak S (2022), "Access and determinants of formal agriculture credit in Uttar Pradesh, India", Journal of Rural Development, Vol. 41 No.02, pp.185-197. https://doi.org/10.25175/jrd/2022/v41/i2/172905
20. Kumar, A, Singh, KM & Sinha S (2010), "Institutional credit to agriculture sector in India: Status, performance and determinants", Agricultural Economics Research Review, Vol. 23 No.2, pp. 253-264. https://doi.org/10.22004/ag.econ.96935
21. Kumar, A, Singh, DK & Kumar P (2007), "Performance of rural credit and factors affecting the choice of credit sources", Indian Journal of Agricultural Economics, Vol. 62 No. 3, pp. 297-313. https://doi.org/10.22004/ag.econ.204524
22. Kumar, J & Bhatt MS (2016), "Measurement of credit constraint to farming households: A case study of jaipur and rajsamand districts in rajasthan (an empirical analysis)", International Journal of Multidisciplinary Research and Development, Vol. 3 No.3, pp. 33-40.
23. Karthick, V & Madheswaran S (2020), "Determinants of agricultural credit in rural India by social group", Institute for Social and Economic Change, paper no. 490.
24. Kumar, V & Thakur K (2023), "Assessing the dynamics of agricultural credit flow in Himachal Pradesh", Journal of Emerging Technologies and Innovative Research, Vol. 10 No.12, pp. 808-815. http://doi.one/10.1729/Journal.37261
25. Keerthikumara, SM & Kumari DSS "Effects of institutional agricultural credit on growth of agriculture in India", GAU Research Journal, Vol. 47 No.3, pp. 172-179.
26. Kumar, A, Singh, RKP, Jee S, Chand, S, Tripathi G & Saroj S (2015), "Dynamics of access to rural credit in India: patterns and determinants", Agricultural Economics Research Review, 28 (conf), 151-166. http://doi.org/10.5958/0974-0279.2015.00030.0
27. Kumar, J & Nayaji A (2014), "Doubling of Agriculture Credit and Its Effect on Farmers on Rajasthan", International Journal of Research in Management & Social Science, Vol. 2, No. 2, pp. 74-77.
28. Kumar, A, Singh, KM & Sinha S (2010), "Institutional credit to agriculture sector in India: Status, performance and determinants", Agricultural Economics Research Review, Vol. 23 No.2, pp. 253-264. https://doi.org/10.5958/0974-0279.2022.00019.2
29. Kumar, S (2023), "Diversification of agriculture in India: A regional perspective. International Journal of English Literature and Social Sciences, Vol. 8 No.3, pp. 301-312. https://doi.org/10.22161/ijels.83.49
30. Motsoari, C, Cloete, PC & Van Schalkwyk, HD (2015), "An analysis of factors affecting access to credit in Lesotho's smallholder agricultural sector", Development Southern Africa, Vol. 32 No. 5, pp.592-602. https://doi.org/10.1080/0376835X.2015.1044077
31. Mohan, R (2006), "Agricultural credit in India: Status, issues and future agenda", Economic and Political Weekly, pp. 1013-1023. http://doi.org/10.2307/4417965
32. Meena, A, Meena AK & Meena A (2023), "Patterns, determinants and challenges of horticulture diversification in India",. International Research Journal of Business Studies, Vol. 16 No.1, pp. 99-110. http://doi.org/10.21632/irjbs.16.1.99-110
33. Mohapatra, S & Mishra, RK (2020), "Status of institutional credit disbursement of agricultural sector in Odisha, India", International Journal of Current Microbiology and Applied Sciences, Vol. 9 No.7, pp.-2065.

http://doi.org/10.20546/ijcmas.2020.907.237

34. Neogi, S & Ghosh BK (2022) Evaluation of crop diversification on Indian farming practices: A panel regression approach. Sustainability, Vol. 14 No. 24, pp. 16861. http://doi.org/10.3390/su142416861
35. Nithin, KN (2016), "A Study on trends and impact of agricultural credit in India", Advances in Life Sciences, Vol. 5 No. 10, pp. 4077-4081.
36. Narayanan, S (2016), "The productivity of agricultural credit in India", Agricultural Economics, Vol. 47 No. 4, pp. 399-409. https://doi.org/10.1111/agec.12239
37. Olaoye, OJ, Ashaolu, OF, Idowu AA, Akintayo, IA & Talabi JO (2011), "Determinants of demand for Ogun State Agricultural and Multipurpose Credit Agency (OSAMCA) loans among fish farmers in Ogun state", Nigeria. Journal of Sustainable Development in Africa, Vol. 13 No. 4, pp.141-156.
38. Okerenta, SI & Orebiyi JS (2005), "Determinants of agricultural credit supply to farmers in the Niger Delta Area of Nigeria", Journal of Agriculture and social Research (JASR), Vol. 5 No. 1, pp. 67-72. https://doi.org/10.4314/jasr.v5i1.2831
39. Ololade, R. A., & Olagunju, F. I. (2013), "Determinants of access to credit among rural farmers in Oyo State, Nigeria", Global Journal of Science Frontier Research Agriculture and Veterinary Sciences, Vol. 13 No. 2, pp.16-22.
40. Oyedele, G. A., & Akintola, J. O. (2012). Determinants of access to credit in Nigerian agriculture. Journal of Development and Agricultural Economics, Vol. 4 No.10, pp. 275-286. https://doi.org/10.5897/JDAE.9000038
41. Pradhan, MS (2020), "Role of agriculture finance in Rajasthan: Development of Rajasthan - An analytical study", International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET), Vol. 3 No.7, pp. 258-262.
42. Poddar, RS, Kumar, HS, Murthy, HG & Murthy TN (1995), "Impact of credit on cropping pattern and cropping intensity on farms in unirrigated and irrigated villages in Bijapur district of Karnataka-an application of linear programming technique", Agricultural Economics Research Review, Vol. 8 No. 1, pp. 29-42. http://doi.org/10.22004/ag.econ.265859
43. Rengarajan, V & Sushmitha, R (2024), "Agricultural loan utilization and repayment behaviour among farmers in Thanjavur", International Journal of Creative Research Thoughts, Vol. 12 No. 3, pp. 181-186.
44. Rawat, R, Shukla, AN, Tewari, SK & Husain, N (2020), "An analysis of factors affecting the flow of agricultural credit in Uttarakhand", Journal of Pharmacognosy and Phytochemistry, Vol. 9 No. 2, pp.1062-1069.
45. Rahman, Z, Islam, MJ, Mahmuda, S & Hossain ME (2022), "Factors influencing farmers' access to formal credit market in naogaon district of Bangladesh: An Empirical Analysis. European Journal of Business and Management Research, Vol. 7 No. 5, pp. 30-38. https://doi.org/10.24018/ejbmr.2022.7.5.1593
46. Rathi, MR & Sharma, D (2020), "Fueling agricultural growth in Madhya Pradesh through formal credit-A way towards financial inclusion. BSSS Journal of Commerce, Vol. 12 No. 1, pp. 01-15. https://doi.org/10.51767/joc1201
47. Ranguwal, Sangeet & Kaur, Parminder (2022), Access to Institutional Credit in Rural Punjab. The Journal of Rural and Agricultural Research, Vol. 22 No. 02, pp. 9-15.
48. Roy, B (2019), "Temporal and spatial variations in institutional credit and its impact on agricultural production in India", Journal of Economic Policy and Research, Vol. 14 No. 2, pp.14-30.
49. Roy, S. K. (2007), Economics of change in cropping pattern in relation to credit: A micro level study in West Bengal. Indian Journal of Agricultural Economics, Vol. 62 No. 2, pp. 216. https://doi.org/10.22004/ag.econ.204516
50. Shiva swamy, GP, Raghavendra, KJ, Anuja, AR, Singh, KN, Rajesh, T & HV, HK (2020), "Impact of institutional credit on agricultural productivity in India: A time series analysis", The Indian Journal

of Agricultural Sciences, Vol. 90 No. 2, pp. 412-417. http://doi.org/10.56093/ijas.v90i2.99033

51. Sinha, A., & Kundu, D. (2020), "Exploring the factors that determine flow of agricultural credit to Indian states", Ramanujan International Journal of Business and Research, Vol. 5, pp. 123-137. https://doi.org/10.51245/rijbr.v5i1.2020.220
52. Soni, AK & Saluja, HP (2012), "Role of co-operative bank in agricultural credit: A study based on Chhattisgarh", Abhinav Journal Article, Vol. 1 No. 10, pp. 2277-1166.
53. Sahu, GB (2007), "Supply analysis of institutional credit to agriculture for major states in India", Indian Journal of Agricultural Economics, Vol. 62 No.4, pp.664.
54. Sidhu, RS, & Gill, SS (2006), "Agricultural credit and indebtedness in India: Some issues", Indian Journal of Agricultural Economics, Vol. 61 No. 1, pp. 11. https://doi.org/10.22004/ag.econ.204443
55. Samal, B. (2002), "Institutional credit flow to West Bengal agriculture: Revisited", Indian Journal of Agricultural Economics, Vol. 57 No. 3, pp. 546-559. https://doi.org/10.22004/ag.econ.297904
56. Singha, P & Sinha, A. "Estimating the impact of crop diversification on economic growth in India: A quantitative assessment", International Journal of Recent Technology and Engineering, Vol. 8 No. 4, pp. 5771-5776. https://doi.org/10.35940/ijrte.D8542.118419
57. Sidhu, RS, Vatta, K & Kaur A (2008), "Dynamics of institutional agricultural credit and growth in Punjab: Contribution and demand-supply gap", Agricultural Economics Research Review, Vol. 21(conf), pp. 407-414. https://doi.org/10.22004/ag.econ.47891
58. Wicaksono, E. (2014), "The impact of agricultural credit on rice productivity", International Journal on Advanced Science, Engineering and Information Technology", Vol. 4 No. 5, pp. 322. https://doi.org/10.18517/ijaseit.4.5.427
59. Yeasmin, S, Haque, S, Adnan, KM, Parvin, MT, Rahman, MS, Rahman, KM & Hossain, M E. (2024), "Factors influencing demand for, and supply of, agricultural credit: A study from Bangladesh", Journal of Agriculture and Food Research, Vol. 16, pp. 101173. https://doi.org/10.1016/j.jafr.2024.101173
60. Yadav, IS & Rao, MS (2020), "Determinants of institutional agricultural credit in India: Field data evidence from small and marginal farmers", Agricultural Economics Review, Vol. 21 No. 2, pp. 68-84s.