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# Kisan Credit Card (KCC) Scheme-Constraints, Impacts, and Policy Interventions: A Review

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***ABSTRACT***
***Purpose:*** *The Kisan Credit Card (KCC) scheme serves as a crucial financial instrument for ensuring timely and affordable credit access to farmers, thereby reducing dependence on informal lending sources. However, its effectiveness is often hindered by institutional, financial, and socio-economic barriers, including complex application procedures, limited rural banking infrastructure, high loan default risks, and low financial literacy.*
***Research Method****: The study based on secondary data, information collected various research papers, review articles, book chapter and website.*
***Finding:*** *This review examines key policy interventions and best practices aimed at improving KCC adoption, accessibility, and efficiency. Recent digital transformations, such as online application portals, Aadhaar-linked verification, mobile banking, and AI-driven credit monitoring, have streamlined loan processing and enhanced financial security. Expanding KCC eligibility to tenant farmers, sharecroppers, and women farmers has further strengthened rural credit inclusivity. Additionally, financial literacy programs, community-led awareness initiatives, and Financial Literacy Centres (FLCs) have played a pivotal role in educating farmers on digital banking and credit management. While these advancements offer promising solutions, sustained efforts in technological innovation, policy reform, and financial education are essential for maximizing the KCC scheme's impact, ensuring long-term financial empowerment and resilience among farmers in India's evolving agricultural landscape.*
***Key Words:*** *Affordable credit, farmers, policy reform, long-term, empowerment*

## INTRODUCTION

The Kisan Credit Card (KCC) Scheme, introduced in 1998-1999 as a collaborative initiative by the Government of India, the Reserve Bank of India (RBI), and the National Bank for Agriculture and Rural Development (NABARD) (Mehta et al., 2016), was designed to enhance access to institutional credit for farmers. This initiative aims to provide timely, flexible, and cost-effective credit to farmers, thereby reducing their reliance on informal credit sources that are often characterized by exorbitant interest rates. The scheme facilitates short-term credit for crop production, working capital for allied agricultural activities such as dairy, poultry, and fisheries, and, to a limited extent, consumption needs. Over the years, the KCC scheme has undergone several modifications to align with evolving agricultural practices, financial policies, and technological advancements (Pandian, 2021). Significant enhancements in the scheme include the integration of digital transaction mechanisms, smart cards, and RuPay debit cards, which have improved transactional efficiency, transparency, and accessibility of funds. Additionally, the incorporation of insurance coverage for both crops and farmers, as well as concessional interest rates under specific conditions, has further bolstered the scheme's utility. However, despite these improvements, the effective utilization and accessibility of KCC remain constrained by multiple structural, administrative, and financial challenges (Thomas, 2022). One of the key impediments is the bureaucratic inefficiency and procedural complexity associated with availing credit through KCC. Many small and marginal farmers encounter difficulties in completing the requisite documentation, which, coupled with their limited financial literacy, restricts their ability to fully utilize the scheme. Moreover, inadequate banking infrastructure in rural areas exacerbates accessibility issues, leading to delays in loan disbursement and limiting the reach of KCC among eligible beneficiaries. Tenant farmers, sharecroppers, and women farmers are disproportionately affected due to restrictive eligibility criteria and lack of collateral, thereby increasing financial exclusion among these vulnerable groups (Chinnala, 2024). Furthermore, while the scheme offers concessional interest rates, the benefits are often limited to a specific period, after which high-interest rates pose a financial burden on farmers. Additional constraints such as inadequate sanctioned credit limits, regional disparities in scheme implementation, and difficulties in timely repayment contribute to the underutilization of KCC benefits. These challenges hinder agricultural productivity and economic stability, thereby necessitating a systematic evaluation of the scheme's limitations and their broader implications on rural financial inclusion (Singh et al., 2022).

This study aims to critically analyze the key constraints that impede the effectiveness of the KCC scheme, focusing on administrative inefficiencies, financial barriers, and socio-economic determinants that influence its adoption. By assessing these systemic barriers, this research intends to provide evidence-based insights into the policy gaps that need to be addressed to optimize the scheme's impact. Strengthening the institutional credit framework is vital for fostering inclusive financial growth, enhancing agricultural productivity, and ensuring long-term economic resilience among farming communities (Srivani, 2023).

A key area of potential improvement involves leveraging digitalization and financial technology to streamline credit accessibility. The integration of e-KCC and mobile banking solutions can significantly reduce procedural delays, enhance transparency, and ensure seamless access to credit for farmers in remote locations (Gupta, 2023). Additionally, policy interventions aimed at simplifying documentation requirements, expanding banking infrastructure in rural areas, and enhancing financial literacy programs can improve the reach and efficiency of KCC (Goyal, 2024). Addressing these constraints is crucial to realizing the full potential of the scheme, promoting sustainable agricultural development, and ensuring economic stability for small and marginal farmers. Therefore, a comprehensive evaluation of the existing challenges and the implementation of targeted policy reforms are essential to making the KCC scheme more inclusive, efficient, and impactful in achieving its intended objectives.

| Parameter | Kisan Credit Card | Informal Credit (Moneylenders, Traders) |
|---|---|---|
| Interest Rate | 4–7% (subsidized) | 24–60% (high interest) |
| Loan Processing Time | Lengthy (bureaucratic delays) | Quick (but often exploitative) |
| Repayment Flexibility | Structured (linked to harvest cycle) | Rigid (often exploitative terms) |
| Collateral Requirement | Land or crop insurance required | No formal collateral but high risk of asset loss |
| Access & Awareness | Limited (low financial literacy) | High (but exploitative) |
| Financial Inclusion Impact | High (if effectively implemented) | Increases debt burden on small farmers |

Table.1 Comparison of KCC and Informal Credit Sources

## MATERIAL AND METHODS:

This review article based on secondary data and authentic web site. Secondary resources in comprises such as, book chapter, original research paper, articles and government web site.

## RESULT AND DISCUSSION

### Major Constraints Faced by KCC Beneficiaries

The efficacy of the Kisan Credit Card Scheme in facilitating agricultural credit accessibility is contingent upon the robustness and efficiency of institutional frameworks governing its execution. However, numerous administrative impediments and procedural inefficiencies continue to obstruct farmers from obtaining timely financial assistance (Mulay et al., 2023). Two principal institutional constraints that undermine the effectiveness of the KCC scheme include the protracted application and approval process, as well as inefficiencies in loan disbursement, both of which critically affect agricultural operations and financial decision-making among farmers. A fundamental institutional challenge associated with KCC accessibility is the intricate and prolonged application process, which acts as a deterrent, particularly for small and marginal farmers. This complexity originates from rigorous documentation prerequisites, excessive verification procedures, and bureaucratic hurdles embedded within the loan approval workflow. Prospective beneficiaries are mandated to furnish land ownership records, identity credentials, revenue documentation, and historical credit reports, many of which are inaccessible to tenant farmers, sharecroppers, and landless agricultural workers (Venkatesh, 2015). The absence of an integrated, digitized application system further exacerbates these delays, leading to a critical mismatch between fund availability and agricultural input procurement schedules. Additionally, inconsistencies in credit evaluation frameworks across diverse financial institutions result in non-uniform approval rates. While public sector banks play a dominant role in disbursing KCC loans, regional disparities in banking penetration substantially hinder accessibility (Bordoloi and Das, 2015). Farmers in remote and economically weaker regions frequently encounter extended procedural delays due to inadequate banking infrastructure and excessive reliance on intermediaries, increasing vulnerability to fraudulent practices. Furthermore, the persistence of manual documentation processing in many rural banking institutions results in extended turnaround periods, compelling farmers to resort to alternative credit sources, often characterized by exorbitant interest rates (Bhatore et al., 2020).

Even subsequent to loan approval, inefficiencies in fund disbursement remain a major obstacle that undermines the intended benefits of the KCC scheme. Institutional bottlenecks such as excessive workload in rural bank branches, insufficient staffing, and the absence of automation in agricultural loan processing contribute to significant delays in fund release (Hurley and Adebayo, 2016). This delay has deleterious effects on farming activities, given the seasonal nature of agriculture, which necessitates synchronized financial support for optimal productivity. Moreover, financial institutions often engage in partial disbursement of sanctioned amounts, citing elevated default risks and volatile market conditions. This practice disproportionately affects small-scale farmers, whose dependency on institutional credit is crucial for acquiring essential inputs such as high-quality seeds, fertilizers, and crop protection chemicals. The incongruence between loan disbursement schedules and cropping cycles further intensifies financial distress among farmers, as delays in fund allocation necessitate deferred input purchases or compel them to seek informal credit avenues, often subject to usurious interest rates (Fedullo et al., 2022).

An additional concern pertains to the absence of an effective monitoring framework to ensure that disbursed credit aligns with the actual financial requirements of farmers. In several instances, financial institutions implement rigid and non-adaptive loan structures that fail to account for crop-specific expenditure patterns and seasonal income fluctuations, thereby complicating repayment dynamics. Manual verification procedures further exacerbate these inefficiencies, particularly in regions characterized by inadequate internet connectivity and underdeveloped banking infrastructure. The integration of digital banking solutions, such as e-KCC platforms and mobile-based transaction mechanisms, holds significant potential to mitigate these structural inefficiencies by expediting the application process, enhancing transparency in loan disbursement, and reducing reliance on intermediaries. Moving forward, comprehensive policy interventions and technological innovations are imperative to streamline KCC implementation, improve institutional responsiveness, and ensure equitable access to agricultural credit, thereby fostering sustainable rural financial inclusion and agricultural productivity (Abdurahman, 2023).

**Financial and Credit-Related Constraints**

Access to adequate and affordable institutional credit is a fundamental determinant of agricultural productivity and rural economic stability. The Kisan Credit Card scheme was designed as a policy intervention to provide farmers with timely financial assistance; however, various financial and credit-related constraints continue to hinder its effectiveness. Prominent challenges associated with the scheme include insufficient credit limits, high interest rates coupled with hidden charges, and repayment difficulties, all of which exacerbate financial distress among small and marginal farmers, thereby affecting agricultural sustainability (Mishra and Chaudhary, 2021). One of the most pressing financial limitations encountered by KCC beneficiaries is the inadequacy of sanctioned credit limits. Smallholder farmers frequently receive loan amounts that fall significantly short of their actual financial requirements, thereby restricting their ability to invest in quality agricultural inputs such as high-yield seeds, balanced fertilizers, and modernized farm equipment (Kubitza et al., 2024). The credit limit determination framework predominantly relies on past land records, cropping patterns, and previous repayment histories, often disregarding fluctuations in input costs and volatile market prices. Additionally, tenant cultivators, sharecroppers, and landless farmers frequently encounter barriers to accessing optimal credit due to the absence of formal land ownership documentation. Since KCC loans are intrinsically linked to landholding size, small-scale farmers with fragmented land parcels receive insufficient financial support, thereby compelling them to seek high-cost informal credit sources, which exposes them to exploitative lending practices (Kumar et al., 2022). This financial constraint directly undermines agricultural productivity by forcing farmers to curtail input utilization, ultimately resulting in suboptimal yields and economic instability (Akram et al., 2019). Although the KCC scheme is intended to provide subsidized interest rates to farmers, several hidden financial costs significantly inflate the actual borrowing expense. While the effective interest rate for short-term KCC loans is advertised as approximately 4% per annum, contingent upon timely repayment incentives, numerous farmers remain unaware of associated processing fees, documentation costs, and mandatory insurance premiums, which collectively increase their financial burden. Furthermore, certain commercial banks impose additional service charges and penalties for delayed payments, which further deteriorate the financial viability of borrowing under KCC (Bordoloi and Das, 2015). An emerging concern is the growing practice among banks of converting short-term crop loans into long-term loans, often as a strategy to mitigate non-performing asset (NPA) risks. However, this restructuring leads to higher interest rates, thereby prolonging farmers' indebtedness and constraining their capacity for sustainable credit repayment (Kambali and Panakaje, 2022). The lack of financial literacy among rural farming communities further exacerbates these issues, as many farmers fail to comprehend the nuances of loan agreements and interest accumulation mechanisms, leaving them vulnerable to escalating debt burdens. Agricultural income is inherently seasonal and unpredictable, creating substantial challenges for the timely repayment of KCC loans. Factors such as erratic climatic conditions, pest infestations, and market price volatility frequently result in lower-than-expected agricultural yields, impeding farmers' ability to meet repayment deadline. Although the KCC scheme ostensibly incorporates a flexible repayment structure, many farmers continue to struggle with debt clearance, leading to instances of loan rollover and escalating interest liabilities. Moreover, a considerable proportion of small and marginal farmers lack diversified income streams, making them disproportionately susceptible to cyclical debt traps. Defaulting on KCC repayments not only results in negative credit histories but also restricts access to future institutional credit, thereby increasing reliance on informal moneylenders who impose exorbitant interest rates (Joshi, 2022). This dependence on informal credit mechanisms exacerbates financial instability and entrenches rural indebtedness, perpetuating economic vulnerability among smallholder farmers (Malkova, 2025). Addressing these financial constraints necessitates the implementation of targeted policy interventions aimed at enhancing credit accessibility, improving financial literacy, and ensuring greater transparency in loan disbursement and repayment structures. Strengthening institutional mechanisms to offer need-based, flexible, and farmer-friendly financial services is imperative for maximizing the intended benefits of the KCC scheme and fostering long-term agricultural sustainability.

**Awareness and Accessibility Issues**

Access to institutional credit through the Kisan Credit Card scheme is vital for enhancing agricultural productivity and strengthening the financial resilience of farmers. Despite its potential to provide timely credit at concessional rates, several challenges hinder its effective adoption and utilization. Among the most pressing barriers are low financial literacy and regional disparities in the implementation of the scheme, particularly in remote and economically underdeveloped areas (Kumar et al., 2024). Addressing these challenges is crucial to ensuring that farmers can fully benefit from institutional credit and reduce their dependence on informal and high-cost borrowing mechanisms. Financial literacy is a key determinant in the successful utilization of credit facilities. However, a significant proportion of Indian farmers remain unaware of the eligibility criteria, benefits, and repayment obligations associated with the KCC scheme (NABARD. rural Credit and Financial Inclusion Report, 2021). The lack of financial education, especially among small and marginal farmers, inhibits their ability to make informed borrowing and repayment decisions. Many are unfamiliar with concessional interest rates, loan renewal procedures, and the government's interest subvention schemes. This lack of awareness often results in missed opportunities to renew and extend loans on favorable terms, leading to unnecessary defaults and financial distress (Aneja, 2015). Additionally, misconceptions regarding hidden charges, penalty fees, and stringent repayment terms deter many farmers from availing themselves of KCC loans. The absence of structured financial literacy programs exacerbates this issue, preventing farmers from understanding how to optimize their access to institutional credit and avoid falling into debt cycles. Another major concern is that a large segment of rural borrowers continues to rely on informal lenders due to the perception that formal banking institutions involve excessive procedural complexities and bureaucratic hurdles (RBI, Financial Inclusion Report 2022). Many farmers, particularly those with limited education, find it difficult to navigate the loan application process, account maintenance requirements, and digital banking transactions (Parappurathu et al., 2019). The challenges of opening bank accounts, submitting required documentation, and understanding banking formalities discourage them from accessing formal credit systems. This reluctance perpetuates reliance on moneylenders who charge exorbitant interest rates, leading to cycles of indebtedness and economic vulnerability.

The implementation of the KCC scheme is not uniform across India, resulting in significant geographical disparities in access to agricultural credit. Farmers in remote, tribal, and economically weaker regions face greater hurdles in obtaining institutional credit due to poor banking infrastructure, inadequate financial service points, and limited digital connectivity (Malik and Malik, 2022). The scarcity of rural bank branches, ATMs, and microfinance institutions severely restricts farmers' ability to apply for and utilize KCC loans. In many cases, farmers must travel long distances to access banking facilities, increasing both the cost and time associated with obtaining credit.

Additionally, bureaucratic inefficiencies and procedural delays are more pronounced in underdeveloped regions, where banking institutions often struggle with staff shortages, logistical constraints, and weak financial monitoring systems (Mulay et al., 2023). These challenges contribute to prolonged loan approval times, inconsistent disbursement processes, and high rejection rates. The administrative inefficiencies discourage many farmers from seeking credit, forcing them to depend on informal sources despite the availability of institutional financing.

The impact of regional disparities is further intensified by variations in state-level policies and administrative efficiency. States with well-developed agricultural credit infrastructures tend to have higher KCC adoption rates, whereas states with weaker financial frameworks struggle with low penetration and poor loan recovery rates. This unequal access results in an imbalanced financial inclusion landscape, where farmers in well-connected regions benefit significantly more from institutional credit than their counterparts in agrarian hinterlands (Chanda, 2020).

To address these barriers, it is imperative to implement targeted financial literacy programs that educate farmers about the benefits, processes, and obligations associated with the KCC scheme. Establishing mobile banking units, expanding rural banking networks, and leveraging digital financial services can also play a critical role in bridging the accessibility gap. Additionally, simplifying application procedures, reducing bureaucratic red tape, and ensuring timely loan disbursement will enhance the overall effectiveness of the KCC scheme. By addressing these systemic challenges, policymakers and financial institutions can ensure that institutional credit truly serves as a catalyst for agricultural development, rural economic stability, and financial empowerment of farmers (Singh and Kadam, 2024).

**Technological and Digital Challenges in KCC Implementation**

The integration of digital financial services within the Kisan Credit Card scheme holds immense potential for revolutionizing agricultural credit accessibility, optimizing transaction efficiency, and ensuring timely loan disbursement to farmers. However, despite the transformative prospects of electronic KCC (e-KCC), its adoption remains limited due to various technological, infrastructural, and socio-economic challenges (Mishra and Chaudhary, 2021).The persistent digital divide, coupled with inadequate financial literacy and limited banking outreach in rural areas, significantly hampers the effectiveness of digital financial inclusion initiatives, restricting farmers from fully leveraging the benefits of the KCC scheme. One of the primary obstacles to the adoption of e-KCC services is the low level of digital literacy among farmers, particularly small and marginal cultivators who constitute the majority of agricultural households (Prakash and Kumar, 2016). Many rural farmers lack the requisite knowledge and technical proficiency to navigate digital banking platforms, including internet banking, mobile banking applications, and digital wallets. This deficiency not only limits their ability to access credit efficiently but also discourages them from transitioning away from conventional cash-based transactions (Mishra and Chaudhary, 2021). The reluctance to embrace digital financial systems is further exacerbated by apprehensions regarding online fraud, cyber security threats, and the perceived complexity of digital financial operations. Without structured training programs tailored to rural populations, the digital transformation of agricultural credit will remain incomplete. Beyond individual digital literacy, systemic issues such as poor network connectivity and insufficient access to smartphones or internet-enabled devices further constrain the effectiveness of e-KCC services (Gautam et al., 2021). Many farming communities, particularly in remote and economically disadvantaged regions, continue to rely on basic feature phones that lack internet capabilities. Consequently, these farmers are unable to utilize essential online banking services such as real-time loan tracking, digital payment systems, and financial advisory platforms. Furthermore, fluctuating internet speeds and frequent network disruptions in rural areas pose additional challenges, making digital transactions unreliable and inefficient (McIntosh andMansini, 2018). The inadequacy of rural banking infrastructure remains a significant barrier to the widespread implementation of digital KCC services. A large proportion of villages in India still lack sufficient bank branches, ATMs, and banking correspondents, making it difficult for farmers to access financial services without undertaking long and costly journeys to urban centers. This geographical limitation renders digital banking solutions impractical for many, as physical access to financial institutions remains a prerequisite for resolving technical issues, completing documentation, and seeking assistance with digital transactions. Moreover, the absence of localized support services, such as helplines or financial literacy campaigns, discourages farmers from embracing digital platforms for their credit and banking needs (Kyeyune and Ntayi, 2025). Another critical challenge is the reluctance of financial institutions to invest in upgrading rural banking infrastructure. Many rural banks still operate on outdated technological frameworks, resulting in frequent server downtimes, slow transaction processing, and security vulnerabilities (Malladi et al., 2021). The inefficiencies within banking systems create a lack of trust among farmers regarding digital transactions, reinforcing their reliance on traditional cash-based financial practices. Additionally, many commercial banks have yet to fully integrate digital payment solutions with agricultural credit schemes, further limiting the accessibility of e-KCC services. Despite these obstacles, targeted policy interventions and capacity-building initiatives can significantly improve the adoption of e-KCC services. Expanding rural broadband infrastructure, promoting financial technology (FinTech) innovations, and launching digital literacy campaigns specifically designed for farmers can bridge the gap between traditional and digital banking systems. Establishing mobile banking units, developing user-friendly applications in regional languages, and simplifying e-KCC on boarding procedures can further encourage adoption (Leem and Eum, 2021). Moreover, financial institutions should collaborate with local cooperatives, self-help groups, and community organizations to create grassroots awareness programs that educate farmers on the advantages and security measures associated with digital banking. While the e-KCC financial literacy campaigns, discourages farmers scheme has the potential to revolutionize agricultural finance, several structural and technological barriers continue to hinder its widespread adoption. Addressing issues related to digital literacy, network accessibility, banking infrastructure, and institutional responsiveness is crucial to ensuring that farmers, particularly those in marginalized regions, can fully benefit from digital financial inclusion. By implementing a holistic approach that combines infrastructural development with farmer-centric digital training programs, policymakers and financial institutions can enhance the effectiveness of e-KCC, ultimately fostering a more resilient and financially empowered agricultural sector.

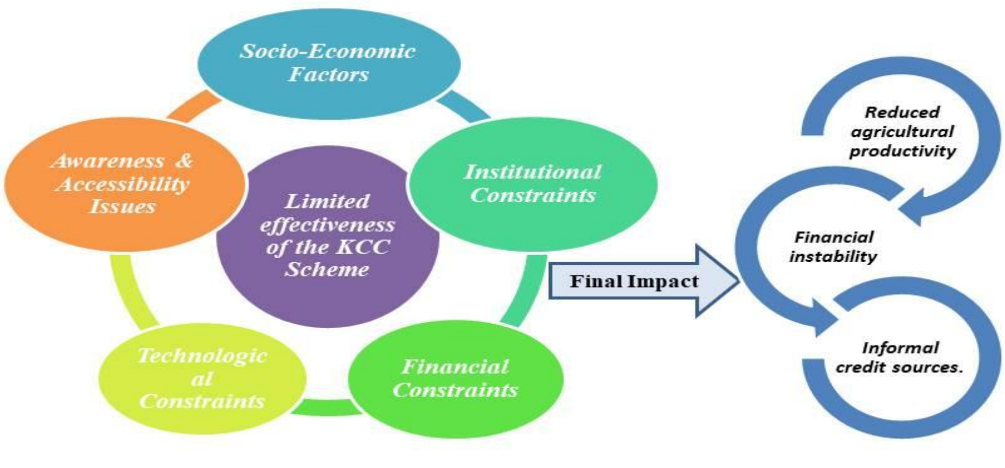


Fig.1 Conceptual Framework of KCC Constraints and Impacts

**Socio-Economic Constraints in KCC Accessibility**

The Kisan Credit Card scheme was established to provide timely, affordable, and easily accessible institutional credit to farmers, with the aim of improving agricultural productivity and financial stability. However, various socio-economic barriers continue to hinder equitable access to this crucial financial resource, particularly among tenant farmers, smallholders, and marginalized agricultural communities. Structural constraints such as land ownership requirements, socio-political influences, and economic disparities limit the inclusivity of the scheme, often leaving the most vulnerable farmers without adequate financial support (Goyal, 2024). One of the major limitations of the KCC scheme is its exclusionary approach toward tenant farmers, sharecroppers, and landless agricultural labours due to the rigid land ownership requirement (NABARD, rural Credit and Financial Inclusion Report, 2021). Since KCC eligibility is primarily tied to formal landholding documents, farmers who cultivate leased or informally held land are often unable to access institutional credit. This results in their continued dependence on informal moneylenders who impose exorbitant interest rates and exploitative repayment terms (Nigade & Deshmukh, 2023). As a result, tenant farmers face significant financial distress, restricting their ability to make long-term agricultural investments, adopt modern farming techniques, or even sustain their seasonal cultivation requirements. The issue of financial exclusion extends further to smallholders, who, despite qualifying for KCC, receive inadequate credit limits that fail to meet their agricultural investment needs (Bordoloi and Das, 2015). Due to their small and fragmented landholdings, these farmers are often sanctioned minimal credit amounts, which do not cover essential inputs such as high-quality seeds, fertilizers, mechanization, and irrigation infrastructure. Consequently, smallholders continue to rely on informal borrowing, further exacerbating their financial vulnerability. This lack of adequate institutional support not only hampers their agricultural productivity but also perpetuates cycles of indebtedness and economic insecurity (Venkatesh, 2015). Beyond economic constraints, political influences and socio-economic hierarchies significantly affect the distribution of KCC loans. There have been reported cases where political intervention skews the allocation of agricultural credit, favoring individuals with political affiliations or social influence (Kumar et al., 2023). This preferential treatment results in unequal access to financial support, leaving socially disadvantaged farmers marginalized and struggling to secure much-needed credit. Farmers who lack political representation or influence are often deprioritized, despite their genuine need for financial assistance to sustain agricultural operations.

Bureaucratic inefficiencies and corruption further exacerbate barriers to accessing KCC loans. In many cases, farmers face extensive procedural delays, excessive documentation requirements, and the imposition of unofficial charges by intermediaries or banking officials. The presence of middlemen who demand bribes for loan approvals adds an extra layer of financial burden on already struggling farmers. These systemic inefficiencies and unethical practices create a hostile environment for small and marginalized farmers, discouraging them from engaging with formal financial institutions (Mulay et al., 2023). Furthermore, the lack of financial literacy and awareness about KCC benefits significantly contributes to the underutilization of the scheme. Many farmers remain uninformed about the concessional interest rates, repayment structures, and government subsidies available under the KCC program. As a result, they either fail to apply for credit or struggle with repayment due to misconceptions about interest accumulation, penalty clauses, and loan renewal procedures. This gap in financial knowledge further reinforces their reliance on traditional moneylenders, keeping them trapped in cycles of high-interest debt (Aneja, 2015). Regional disparities in KCC implementation also hinder equitable access to credit. Farmers in remote, tribal, and economically backward regions face additional challenges due to the lack of banking infrastructure, inadequate financial service providers, and poor connectivity. The limited presence of rural bank branches, ATMs, and financial literacy programs further alienates these communities from the formal credit system, deepening their financial exclusion (Malik & Malik, 2022). Additionally, weak institutional frameworks and inefficient loan monitoring mechanisms contribute to inconsistent credit distribution, with some states demonstrating significantly higher KCC penetration than others (Chanda, 2020). Addressing these socio-economic barriers requires a multi-faceted approach that includes policy reforms, enhanced financial literacy programs, and strengthened rural banking infrastructure. Simplifying loan application procedures, expanding credit access to tenant farmers, and improving the transparency of loan disbursement can significantly enhance the effectiveness of the KCC scheme (Tripathy and Singh, 2022). Moreover, government agencies, financial institutions, and non-governmental organizations should collaborate to implement targeted financial awareness campaigns that empower farmers with the knowledge and tools necessary to make informed credit decisions. While the KCC scheme has the potential to be a transformative financial tool for Indian farmers, its impact remains limited by structural and socio-economic barriers. Addressing these challenges through inclusive policy measures, technological interventions, and institutional transparency is crucial to ensuring that all farmers, regardless of landholding status or socio-political background, can access the financial resources they need to sustain and grow their agricultural enterprises (Tripathi et al., 2023). By fostering equitable access to institutional credit, India can enhance agricultural productivity, reduce rural indebtedness, and promote long-term economic stability for its farming communities.

**Impact of Constraints on Agricultural Development**

Access to institutional credit is a cornerstone of agricultural development, ensuring financial stability, enhancing productivity, and fostering rural economic growth. The Kisan Credit Card scheme was introduced to provide farmers with timely and affordable credit, thereby reducing their dependence on informal lending sources. However, multiple constraints—ranging from institutional inefficiencies to socio-economic disparities and financial barriers—continue to hinder the effectiveness of this scheme (Kumar et al., 2023). These challenges have far-reaching consequences on agricultural development, rural financial inclusion, and overall economic sustainability. One of the most significant consequences of limited credit access is the decline in agricultural productivity. Farmers require financial resources for purchasing essential inputs such as high-yield seeds, fertilizers, pesticides, and farm machinery. However, delays in loan disbursement, inadequate credit limits, and bureaucratic hurdles often prevent them from securing these inputs on time. As a result, many farmers are forced to reduce the application rates of essential inputs or resort to lower-quality alternatives, leading to suboptimal crop yields and reduced farm profitability. Furthermore, small and marginal farmers, who constitute approximately 86% of India's farming population, are disproportionately affected by restricted access to institutional credit (NABARD, rural Credit and Financial Inclusion Report, 2022). The inability to invest in modern agricultural practices, mechanization, and irrigation infrastructure severely limits their capacity to improve productivity (Takeshima and Mano, 2023). This, in turn, results in inefficient resource utilization, lower yields, and reduced competitiveness in agricultural markets. Over time, these limitations create an economic divide, wherein large-scale farmers with better financial access thrive while smallholders struggle to sustain their livelihoods. In addition to productivity challenges, limited access to formal credit exacerbates financial instability among farmers. Agricultural incomes are inherently seasonal, fluctuating based on crop cycles, market conditions, and climatic factors. Without access to institutional credit, farmers struggle to manage these income variations, leading to financial distress (Singh and Sharma, 2020). The unavailability of affordable credit often forces them to rely on informal moneylenders who impose exorbitant interest rates and exploitative repayment terms. Interest rates in the informal sector can range from 36% to 60% annually, making it nearly impossible for farmers to escape the cycle of indebtedness. Over-reliance on informal credit sources further exacerbates economic vulnerability. Moneylenders and commission agents frequently impose non-transparent lending conditions, including excessive collateral requirements, forced repayments through agricultural produce, and long-term debt entrapment (Dashrath, 2020). These exploitative mechanisms not only restrict farmers' financial autonomy but also contribute to intergenerational debt burdens and land alienation. The inability to break free from such cycles of financial distress has been linked to instances of farmer suicides, further highlighting the urgent need for equitable and accessible institutional credit (Gulati and Juneja, 2019). The inefficiencies within the KCC scheme also contribute to financial inequalities in the rural economy. Large-scale farmers and well-connected individuals who can navigate bureaucratic challenges often receive preferential access to subsidized credit, insurance-linked financial products, and interest subvention schemes. In contrast, smallholders, tenant farmers, and landless agricultural laborers face difficulties in meeting eligibility criteria, securing adequate loan amounts, and obtaining timely approvals (Mishra and Chaudhary, 2021). These systemic biases result in a concentration of financial benefits among wealthier farmers, exacerbating economic disparities and leaving marginalized farmers in distress. Additionally, the lack of credit access prevents farmers from diversifying their agricultural practices or investing in climate-resilient technologies. Given the increasing frequency of extreme weather events due to climate change, access to institutional credit is crucial for adopting sustainable farming methods, such as precision agriculture, agroforestry, and climate-adaptive crop varieties (Timu et al., 2024). The inability to invest in such technologies leaves small and marginal farmers vulnerable to climate shocks, further worsening their financial and social insecurity. The limited reach of formal financial services also restricts rural communities from leveraging digital financial tools, such as mobile banking, e-KCC platforms, and agricultural credit-linked insurance services. Digital financial inclusion could offer numerous benefits, including simplified loan application processes, real-time tracking of credit transactions, and enhanced financial literacy. However, barriers such as low digital literacy, inadequate banking infrastructure, and unreliable internet connectivity prevent many farmers from transitioning to digital financial systems (Reserve Bank of India, 2022). Without targeted interventions to improve digital financial literacy and expand rural banking infrastructure, a large proportion of the farming community will continue to be excluded from the benefits of formal financial markets.

To address these challenges, policy measures must focus on improving the accessibility and efficiency of the KCC scheme. Simplifying loan application processes, relaxing stringent eligibility criteria for tenant farmers, and enhancing rural banking infrastructure are essential steps toward achieving financial inclusion (Dey et al., 2023). Additionally, targeted financial literacy programs and digital training initiatives can empower farmers to utilize digital banking platforms effectively, thereby improving credit accessibility and reducing dependence on exploitative informal lenders.while the Kisan Credit Card scheme has the potential to revolutionize agricultural financing, its impact remains limited due to institutional inefficiencies, socio-economic disparities, and financial barriers. Addressing these challenges through policy reforms, technological integration, and inclusive financial strategies is crucial for ensuring that all farmers, regardless of land ownership status or socio-economic background, have equitable access to institutional credit (Kaur and Dhaliwal, 2018). Strengthening rural credit systems will not only enhance agricultural productivity and financial stability but also contribute to the broader goal of sustainable rural economic development.

**Policy Interventions and Best Practices for Enhancing KCC Accessibility**

The Kisan Credit Card scheme serves as a crucial financial mechanism designed to provide farmers with timely and affordable credit, reducing their dependence on informal and often exploitative lending sources. Despite its significance in enhancing agricultural productivity and rural financial inclusion, several institutional, financial, and socio-economic constraints hinder its accessibility and effectiveness (Mulay et al., 2023). These challenges include bureaucratic inefficiencies, stringent documentation requirements, and limited financial literacy among small and marginal farmers, making it difficult for them to secure timely credit. Recognizing these limitations, policymakers, financial institutions, and technology-driven stakeholders have introduced a range of reforms and best practices to improve KCC coverage, streamline access to agricultural credit, and enhance financial empowerment in rural communities (Goyal, 2024).

A major challenge associated with KCC adoption is the complexity of the application and approval process. Many farmers face difficulties in fulfilling documentation requirements, navigating bureaucratic delays, and securing loan approvals, all of which restrict their ability to access credit when it is most needed (Mandala et al., 2021). To mitigate these barriers, the government has undertaken several reforms: The introduction of digital KCC platforms by financial institutions and government agencies has significantly reduced paperwork and processing times. Farmers can now apply, track, and manage their KCC applications through user-friendly online portals, ensuring faster loan disbursement, greater transparency, and reduced dependence on intermediaries (Bey, 2023). To improve accessibility for small and marginal farmers, the government has simplified KCC eligibility criteria and documentation processes. Measures such as self-declaration forms, Aadhaar-linked verification, and automated credit scoring have expedited loan approvals and reduced procedural bottlenecks (Sharma, 2016). Linking KCC loans with crop insurance schemes, input subsidies, and weather-based credit mechanisms provides farmers with comprehensive financial support. This integration mitigates the risks associated with crop failures and market volatility, thereby promoting agricultural resilience and long-term financial stability (Hoda and Terway, 2015). Historically, the KCC scheme primarily benefited land-owning farmers, inadvertently excluding tenant farmers, sharecroppers, and women farmers, despite their significant contributions to agriculture (Mulay et al., 2023). In recent years, policy reforms have sought to expand KCC accessibility through targeted initiatives. Given the financial vulnerabilities faced by landless farmers, the government has extended KCC eligibility to tenant farmers through innovative models such as group lending mechanisms, joint liability groups (JLGs), and cooperative credit frameworks. These measures facilitate greater financial inclusion and ensure that a broader spectrum of farmers can benefit from institutional credit. Women farmers often encounter gender-based financial barriers that limit their access to credit. To address this disparity, targeted initiatives such as interest subvention schemes, priority lending policies, and women-led self-help groups (SHGs) have been introduced to enhance financial autonomy and inclusion among female farmers (Biswas et al., 2023). Strengthening the KCC framework requires a multi-dimensional approach that combines policy-driven interventions, digital financial innovations, and capacity-building initiatives. Enhancing rural financial literacy, expanding credit outreach programs, and ensuring better enforcement of farmer-centric policies will be essential in maximizing the benefits of the KCC scheme. By addressing these critical challenges, the scheme can evolve into a more inclusive and efficient financial instrument that not only supports agricultural productivity but also contributes to broader rural economic stability.

**Role of Banks and Financial Institutions**

A significant constraint in the accessibility of the Kisan Credit Card scheme is the inadequate rural banking infrastructure, particularly in remote and underserved regions. Many farmers, especially those in geographically isolated areas, struggle to access formal banking services due to the limited presence of financial institutions, forcing them to rely on informal credit sources that often impose high interest rates and unfavourable lending conditions (Muchira, 2017). To address this challenge, financial institutions have implemented various strategic interventions aimed at expanding banking outreach and enhancing rural financial inclusion. One of the key measures to bridge this gap is the expansion of rural bank branches and ATM networks (Arun and Kamath, 2015).Establishing more rural banking outlets, including dedicated agricultural service centers and financial kiosks, ensures that farmers can conveniently access credit without the need for long and costly travel. Additionally, increasing the number of ATMs in agricultural regions allows farmers to withdraw funds securely and at their convenience, thereby reducing dependency on intermediaries (World Bank, 2021). Another transformative approach is the adoption of mobile banking and the Banking Correspondents (BC) model. The BC model has emerged as a crucial mechanism for reaching unbanked farmers by offering doorstep banking services, digital transaction assistance, and financial counseling. These agents facilitate KCC applications, guide farmers on loan repayment processes, and help them navigate digital financial tools, thereby fostering greater financial literacy and empowerment (Athar, 2024). Mobile banking services, enabled through smartphone applications and USSD-based transactions, further enhance accessibility by allowing farmers to conduct banking activities remotely, reducing both logistical constraints and bureaucratic delays. Leveraging cooperative banks and Regional Rural Banks (RRBs) has played a pivotal role in strengthening KCC accessibility. These institutions are well-integrated within rural communities and offer personalized financial solutions tailored to the needs of smallholder farmers. Cooperative banks and RRBs provide flexible credit facilities with lower transaction costs, ensuring that even marginal and tenant farmers can access institutional credit (Goyal, 2024). Furthermore, microfinance institutions (MFIs) complement this effort by facilitating group lending models and self-help group (SHG)-based financial mechanisms, allowing collective borrowing and risk-sharing among farmers. Efforts to enhance rural banking infrastructure must also be supported by technology-driven innovations and policy interventions that prioritize financial inclusion. Strengthening digital payment ecosystems, promoting financial education initiatives, and integrating KCC services with existing agricultural support programs will be essential in making credit access more seamless and inclusive (Kadaba et al., 2023). By fostering a more robust and farmer-friendly financial ecosystem, these measures can ensure that the KCC scheme effectively fulfills its objective of providing timely and affordable credit to India's agrarian community.

**Strengthening Credit Monitoring and Risk Management**

Loan defaults and the accumulation of non-performing assets (NPAs) continue to pose significant challenges in the effective implementation of the Kisan Credit Card (KCC) scheme. Many farmers, due to erratic income cycles, crop failures, and unpredictable market conditions, struggle to meet repayment deadlines, leading to increased financial risks for lending institutions (BEY et al., 2023). To mitigate these risks and promote financial sustainability, banks have implemented several strategic interventions aimed at improving credit monitoring, offering flexible repayment mechanisms, and integrating risk management solutions. A critical step in minimizing loan defaults is the adoption of real-time credit monitoring systems. Advances in financial technology have enabled banks to employ data analytics, artificial intelligence (AI)-driven risk assessment models, and satellite-based crop monitoring tools to track loan utilization and predict farmers' repayment capacity (Singh and Mritunjay, 2024). By analyzing factors such as weather patterns, soil health, and cropping cycles, these technologies help financial institutions make data-driven lending decisions, reducing the likelihood of defaults and ensuring more responsible credit disbursal. Understanding the seasonal nature of agricultural income, banks have also introduced flexible repayment mechanisms tailored to farmers' cash flow patterns. Unlike conventional loan repayment structures, which often impose rigid deadlines, customized repayment schedules take into account harvest cycles and income fluctuations (Malviya, 2017). Grace periods and interest subvention programs further provide financial relief during adverse climatic conditions or market downturns, preventing farmers from falling into debt traps and enabling them to sustain their agricultural operations. To further safeguard farmers against financial distress, integration with crop insurance and weather advisory services has become an essential component of KCC lending. By ensuring that KCC borrowers are enrolled in crop insurance schemes, financial institutions provide a safety net that protects farmers from climate-induced losses, pest infestations, and unpredictable weather conditions (Dashrath, 2020). Real-time weather forecasting services, coupled with early warning systems, allow farmers to make informed agricultural decisions, ultimately reducing risks associated with loan defaults (Steinbach et al., 2016). Alongside these risk-mitigation strategies, the rapid advancement of financial technology (FinTech) has significantly transformed KCC accessibility through the promotion of digital and mobile banking solutions. The transition to digital KCC services (e-KCC) has streamlined credit access, reduced transaction inefficiencies, and minimized bureaucratic delays. Several key digital initiatives have played a crucial role in this transformation (Mishra and Chaudhary, 2021). The introduction of e-KCC cards and digital wallets has enabled farmers to access their credit facilities without relying on cash-based transactions. By leveraging prepaid card systems and mobile-based financial platforms, farmers can securely manage their funds, make purchases for agricultural inputs, and conduct transactions without the risk of carrying physical currency (Sarma, 2025). This shift not only enhances financial security but also encourages transparency in credit utilization. Furthermore, mobile-based credit disbursement has simplified the borrowing process, allowing farmers to apply for loans, receive disbursements, and make repayments directly through mobile banking applications (Das and Patnaik, 2020). The elimination of manual paperwork and intermediary involvement has significantly reduced transactional delays and operational costs, ensuring timely access to financial resources. To enhance financial inclusion further, banks have also facilitated the integration of KCC accounts with Unified Payments Interface (UPI) and Aadhaar-enabled Payment Services (AEPS) (Kadaba et al., 2023). By linking KCC accounts with biometric authentication systems and secure digital payment gateways, farmers can seamlessly conduct transactions, check loan balances, and receive government subsidies directly into their accounts (Abdurahman, 2023). This integration not only promotes ease of access but also strengthens financial accountability and reduces instances of fraud or fund mismanagement. Collectively, these measures highlight the evolving landscape of KCC lending, where financial institutions are embracing innovative solutions to enhance credit accessibility while safeguarding the financial interests of both farmers and lenders. Strengthening real-time credit monitoring, adopting flexible repayment structures, and leveraging digital banking solutions will be instrumental in making the KCC scheme more inclusive, efficient, and resilient in the face of emerging agricultural challenges.

**Improving Financial Literacy Among Farmers**

Despite the growing availability of digital financial tools and banking solutions, the adoption of the Kisan Credit Card remains hindered by limited financial literacy and digital awareness among farmers (Mulay et al., 2024). Many smallholder and marginal farmers, particularly in rural and remote areas, lack the necessary knowledge and skills to navigate digital banking platforms, apply for credit online, and manage loan repayments effectively. This knowledge gap not only restricts their access to institutional credit but also increases their vulnerability to financial mismanagement and debt cycles. Recognizing the critical role of financial literacy in fostering inclusive agricultural credit access, government agencies, financial institutions, and rural development organizations have launched targeted educational initiatives aimed at empowering farmers with the skills necessary for effective financial decision-making (Malhotra, 2023). One of the key interventions is the education of farmers on digital credit services. Banks, cooperative societies, and government bodies have been conducting awareness campaigns, training workshops, and on-field demonstrations to familiarize farmers with the functionalities of digital banking, online loan application procedures, and secure credit management practices. These programs emphasize user-friendly mobile banking applications, guiding farmers on account monitoring, digital transactions, and grievance redressal mechanisms to enhance their confidence in utilizing e-KCC services (Mishra and Chaudhary, 2021). In addition to periodic training sessions, the establishment of Financial Literacy Centers (FLCs) has played a crucial role in institutionalizing financial education in rural areas. Managed by rural banks, cooperative societies, and non-governmental organizations, these centers serve as dedicated hubs where farmers receive hands-on training in mobile banking, digital credit transactions, and structured loan repayment planning (NABARD, rural Credit and Financial Inclusion Report, 2022). By providing personalized financial counseling and real-time digital banking support, FLCs empower farmers to make informed financial decisions while fostering trust in formal credit systems (Jalota et al., 2024). To further expand financial literacy efforts, community-based financial education programs have been integrated into existing agricultural support networks. By leveraging agricultural extension services, farmer cooperatives, and self-help groups (SHGs), knowledge dissemination has been made more accessible and relatable for rural farmers (Akpaeti and Archibong, 2022). Peer-to-peer learning models, in which digitally literate farmers mentor their counterparts, have proven highly effective in increasing participation and engagement. Additionally, localized financial literacy campaigns conducted in regional languages ensure that farmers from diverse backgrounds can comprehend complex financial concepts with ease (Chandra, 2025). The collective impact of these initiatives is significant, as improved financial literacy fosters greater confidence in digital banking systems, encourages responsible credit utilization, and enhances loan repayment discipline. By equipping farmers with the necessary financial knowledge and digital skills, these programs contribute to the broader goal of strengthening rural financial inclusion, reducing dependency on informal lending sources, and ensuring the sustainable success of the KCC scheme. However, sustained efforts in expanding outreach, adopting innovative learning methods, and integrating technological advancements into financial education remain essential to bridging the financial literacy gap and unlocking the full potential of digital agricultural credit systems.

## CONCLUSION

Effective policy interventions and best practices in KCC implementation are crucial for enhancing agricultural credit accessibility, promoting financial inclusion, and supporting rural development. By simplifying the application process, expanding credit coverage, improving rural banking infrastructure, and integrating digital financial solutions, policymakers and financial institutions can significantly strengthen the impact of the KCC scheme. Furthermore, increasing financial literacy and digital awareness among farmers will ensure sustainable credit utilization, improved repayment rates, and greater economic resilience in the agricultural sector. Moving forward, a multi-stakeholder approach involving government agencies, financial institutions, technology providers, and agricultural cooperatives will be essential in achieving a farmer-centric, inclusive, and digitally empowered KCC ecosystem.

### Recommendations

The study highlights that institutional inefficiencies, financial constraints, and limited awareness significantly hinder the effectiveness of the Kisan Credit Card scheme, restricting access to formal credit for small and marginal farmers. Enhancing digital and financial literacy is crucial for increasing KCC adoption and utilization. Policy interventions focusing on simplified application processes, expanded rural banking infrastructure, and targeted credit support can strengthen financial inclusion. Furthermore, integrating digital banking solutions and flexible repayment mechanisms will improve accessibility and reduce default risks. A multi-stakeholder approach involving policymakers, financial institutions, and agricultural cooperatives is essential to ensure sustainable agricultural credit delivery and rural economic growth.

To enhance the accessibility and efficiency of the Kisan Credit Card scheme, several policy interventions are required. Simplifying application procedures by reducing documentation requirements and integrating digital platforms can expedite credit access. Expanding eligibility criteria to include tenant farmers, women, and sharecroppers will promote broader financial inclusion. Enhancing financial literacy programs is essential to educate farmers on credit management, repayment planning, and digital banking, ensuring informed financial decisions. Strengthening rural banking infrastructure by increasing the number of bank branches, ATMs, and mobile banking units can improve access to institutional credit. Additionally, introducing risk mitigation strategies, such as insurance-linked credit, will safeguard farmers against financial shocks from crop failures or market fluctuations. A multi-faceted approach involving financial institutions, policymakers, and technology-driven solutions is crucial to optimizing the KCC scheme's impact and ensuring sustainable credit access for small and marginal farmers.

### Future Scope

To further enhance the effectiveness of the Kisan Credit Card scheme, future research should focus on three critical areas. First, assessing the role of FinTech in improving agricultural credit distribution is crucial in understanding how digital financial technologies, mobile banking, and blockchain-based credit systems can streamline loan disbursement, reduce transaction costs, and enhance transparency. Investigating the integration of artificial intelligence (AI) and big data analytics in credit risk assessment can provide insights into improving lending efficiency and reducing default rates.

Second, evaluating the long-term impact of digital KCC on farmer incomes will help in determining whether digital financial inclusion has contributed to enhanced productivity, better financial planning, and income stability. Research should explore how e-KCC adoption influences agricultural investments, cropping patterns, and the financial resilience of smallholder farmers. Understanding the relationship between digital credit access and farm profitability will be vital for designing future policy interventions. Finally, studying regional variations in KCC effectiveness will aid in developing targeted policy interventions that address specific geographic, socio-economic, and institutional disparities. Variations in banking infrastructure, literacy levels, and policy implementation significantly affect credit accessibility. Comparative studies across different agro-climatic zones and rural-urban gradients can provide empirical evidence on the factors influencing KCC adoption and success rates. These research directions will contribute to a data-driven approach to financial inclusion, ensuring that KCC policies are adaptive, inclusive, and effective in addressing the diverse needs of Indian farmers.

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**REFERENCES**

1. Abdurahman, M. (2023). An empirical analysis of electronic payment system (EPS) among banking customers in Kerala (Doctoral dissertation, Post Graduate and Research Department of Commerce, Mar Thoma College Chungathara).
2. Akpaeti, A. J., & Archibong, M. N. (2022). Factors influencing the use of digital credit systems among farmers in Akwa Ibom State, Nigeria. AKSU Journal of Agriculture and Food Sciences, 6(3), 168–179.
3. Akram, M. W., Akram, N., Hongshu, W., Andleeb, S., ur Rehman, K., Kashif, U., & Mehmood, A. (2019). Impact of land use rights on the investment and efficiency of organic farming. Sustainability, 11(24), 7148. https://doi.org/10.3390/su11247148
4. Aneja, H. D. R. (2015). Forwarded by Research Supervisor (Doctoral dissertation, Central University of Haryana).
5. Arun, T., & Kamath, R. (2015). Financial inclusion: Policies and practices. IIMB Management Review, 27(4), 267–287. https://doi.org/10.1016/j.iimb.2015.09.004
6. Athar, M. P. M. (2024). Usefulness of business correspondents in Kashmir region—A perception of customers and bankers (Doctoral dissertation, University of Delhi).
7. Bey, B. S., Singh, R., Athawale, S., & Chiphang, S. (2023). Status, trends and challenges of Kisan Credit Cards scheme in north eastern region of India. Indian Journal of Agricultural Marketing, 37, 104–122.
8. BEY, B. S., Singh, R., ATHAWALE, S., & CHIPHANG, S. (2023). Status, trends and challenges of Kisan Credit Cards scheme in north eastern region of India. Indian Journal of Agricultural Marketing, 37, 104-122.
9. Bhatore, S., Mohan, L., & Reddy, Y. R. (2020). Machine learning techniques for credit risk evaluation: A systematic literature review. Journal of Banking and Financial Technology, 4(1), 111–138. https://doi.org/10.1007/s42786-020-00020-9
10. Biswas, D., & Saha, B. (2023). Agricultural sustainability and women: Indian scenario. In Public policies and sustainable development in post-reform India: Regional responses and the way forward (pp. 137–164). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-2385-6_7
11. Block, C. C. U. O. S. (2017). Anil Malviya (Doctoral dissertation, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya).
12. Bordoloi, J., & Das, A. K. (2015). Impact of credit on agricultural production with special reference to crop loan and KCC scheme. Agro-Economic Research Centre for North-East India, Assam Agricultural University, 1–3.
13. Chanda, A. (2020). Evaluating the Kisan Credit Card scheme: Some results for Bihar and India. Arthaniti: Journal of Economic Theory and Practice, 19(1), 68–107. https://doi.org/10.1177/0976747920903524
14. Chandra, S. (2025). Skill development approach for poverty alleviation in India (Doctoral dissertation, Walden University).
15. Chinnala, B. R. (2024). Development strategies and governance in India: Predicaments and challenges. Taylor & Francis. https://doi.org/10.4324/9781003447349
16. Das, A., & Patnaik, N. M. (2020). Innovations in agricultural credit disbursement and payment systems for financial inclusion in rural India. International Journal of Current Microbiology and Applied Sciences, 9(2), 11–18. https://doi.org/10.20546/ijcmas.2020.902.002
17. Dashrath, M. G. S. (2020). Attitude of farmers towards Kisan Credit Card scheme (Doctoral dissertation, Mahatma Phule Krishi Vidyapeeth).
18. Dey, A., Gupta, A. K., & Singh, G. (2019). Innovation, investment and enterprise: Climate resilient entrepreneurial pathways for overcoming poverty. Agricultural Systems, 172, 83–90. https://doi.org/10.1016/j.agsy.2019.02.003
19. Fedullo, T., Morato, A., Tramarin, F., Rovati, L., & Vitturi, S. (2022). A comprehensive review on time sensitive networks with a special focus on its applicability to industrial smart and distributed measurement systems. Sensors, 22(4), 1638. https://doi.org/10.3390/s22041638
20. Gautam, R. S., Kanoujiya, J., Bhimavarapu, V. M., & Rastogi, S. (2021). Financial technology and its impact on poverty in India. International Journal of Management and Humanities (IJMH), 6(3), 1–10.
21. Goyal, D. P. (2024). From fields to finance: Evaluating the impact of Kisan Credit Cards in Saurashtra, Gujarat. [Working paper]. Gujarat.
22. Goyal, P. (2024). From fields to finance: Evaluating the impact of Kisan Credit Cards in Saurashtra, Gujarat. [Working paper]. Gujarat.
23. Gulati, A., & Juneja, R. (2019). Agricultural credit system in India: Evolution, effectiveness and innovations. Indian Council for Research on International Economic Relations (ICRIER).
24. Gupta, G. (2023). The banking channel of financial inclusion: Credit where credit's due. Inclusive Finance India Report 2023, 13–30.
25. Hoda, A., & Terway, P. (2015). Credit policy for agriculture in India: An evaluation. In Supporting Indian farms the smart way. Rationalising subsidies and investments for faster, inclusive and sustainable growth (No. 302). Working Paper. Indian Council for Research on International Economic Relations (ICRIER).
26. Hurley, M., & Adebayo, J. (2016). Credit scoring in the era of big data. Yale Journal of Law & Technology, 18, 148–216.

27. Infrastructure, R. M. (2023). College of Agriculture, Gandhi Krishi Vigyan Kendra, Bengaluru-560065, Karnataka (Doctoral dissertation, University of Agricultural Sciences).
28. Jalota, S., Sharma, S., Barik, M., & Chauhan, S. (2024). Financial literacy and education in enhancing financial inclusion. In E-financial strategies for advancing sustainable development: Fostering financial inclusion and alleviating poverty (pp. 57–72). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-52534-6_5
29. Joshi, G. (2022). Whose fault is it? Loan defaults at the Devkhand bank, India. Emerald Emerging Markets Case Studies, 12(1), 1–24. https://doi.org/10.1108/EEMCS-09-2021-0312
30. Kadaba, D. M. K., Aithal, P. S., & KRS, S. (2023). Impact of Digital Financial Inclusion (DFI) initiatives on the self-help group: For sustainable development. International Journal of Management, Technology, and Social Sciences (IJMTS), 8(4), 20–39. https://doi.org/10.47992/IJMTS.2581.6012.0385
31. Kambali, U., & Panakaje, N. (2022). A review on access to agriculture finance by farmers and its impact on their income. SSRN. https://doi.org/10.2139/ssrn.4104741
32. Kant, R. (2024). Financial technologies (FinTech) in e-commerce. SGSH Publication.
33. Kaur, H., & Dhaliwal, N. K. (2018). Progress of Kisan Credit Card scheme in India. Amity Journal of Agribusiness, 3(1), 26–36.
34. Kubitza, C., Veettil, P. C., Gupta, I., & Krupnik, T. J. (2024). Can information constraints explain the low efficiency in premium quality rice cultivation? Evidence from smallholder farmers in Bangladesh. Journal of Agricultural Economics, 75(2), 617–652. https://doi.org/10.1111/1477-9552.12515
35. Kumar, A., Das, R., KS, A., Bathla, S., & Jha, G. K. (2021). Examining institutional credit access among agricultural households in Eastern India: Trends, patterns and determinants. Agricultural Finance Review, 81(2), 250–264. https://doi.org/10.1108/AFR-04-2020-0054
36. Kumar, A., Rath, N. A., & Singh, R. S. (2024). Impact of Kisan Credit Card on farm productivity and farmer's economy in Odisha: An empirical evaluation. International Journal of Research in Agronomy, 7(3), 698–702.
37. Kumar, A., Sonkar, V. K., & Aditya, K. S. (2023). Assessing the impact of lending through Kisan Credit Cards in rural India: Evidence from Eastern India. The European Journal of Development Research, 35(3), 602–622. https://doi.org/10.1057/s41287-022-00518-7
38. Kyeyune, G. N., & Ntayi, J. M. (2025). Empowering rural communities: the role of financial literacy and management in sustainable development. Frontiers in Human Dynamics, 6, 1424126.
39. Leem, B. H., & Eum, S. W. (2021). Using text mining to measure mobile banking service quality. Industrial Management & Data Systems, 121(5), 993-1007.
40. Malhotra, N. (2023). Priority in inclusive finance. In Microfinance and development in emerging economies (pp. 119–141). Emerald Publishing Limited. https://doi.org/10.1108/9781802620536-010
41. Malik, D. P., & Malik, J. S. (2022). Assessment on the progress of KCC scheme in India. Indian Journal of Extension Education, 58(3), 33–37.
42. Malkova, A. (2025). The impact of formal and informal credit institutions on entrepreneurship. Journal of Financial Economic Policy, 17(3), 297-349.
43. Malladi, C. M., Soni, R. K., & Srinivasan, S. (2021). Digital financial inclusion: Next frontiers—Challenges and opportunities. CSI Transactions on ICT, 9(2), 127–134. https://doi.org/10.1007/s40012-021-00268-4
44. Mandala, G. N., Sangode, P. B., Devi, S. A., & Gandreti, V. R. R. (2021). Problems and constraints faced by farmers in financing and marketing of agricultural produce in India. Universal Journal of Accounting and Finance, 9(2), 139-144.
45. McIntosh, C., & Mansini, C. S. (2018). The use of financial technology in the agriculture sector (No. 872). ADBI Working Paper. https://www.adb.org/publications/use-financial-technology-agriculture-sector
46. Mehta, D., Trivedi, H., & Mehta, N. K. (2016). Indian Kisan Credit Card scheme: An analytical study. BRAND: Broad Research in Accounting, Negotiation, and Distribution, 7(1), 19–23.
47. Mishra, J., & Chaudhary, A. K. (2021). Kisan Credit Card and its impact on financial inclusion in India. International Journal of Scientific and Management Research, 5, 80–86.
48. Muchira, R. (2017). Water and wastewater infrastructure improvement projects in informal settlements: A case study of KISIP project in KCC village, Nairobi County (Doctoral dissertation, University of Nairobi).
49. Mulay, M., Bhusnale, A., & Biradar, J. (2023, October). Innovation in rural banking: Case study of socioeconomic determinants of Kisan Credit Card (KCC) in India. In Conference on Pathways to Sustainable Economy: A Banking and Finance Perspective (pp. 241–256). Singapore: Springer Nature Singapore.
50. Mulay, M., Bhusnale, A., & Biradar, J. (2024). Innovation in rural banking: Case study. In Financial Markets, Climate Risk and Renewables: Conference on Pathways to Sustainable Economy—A Banking and Finance Perspective (SEBF), IIT Bombay, India, October 2023 (p. 241). Springer Nature.
51. Nagarajan, L. C. D. I. (2019). Farmers' attitude towards Kisan Credit Card scheme in Tamil Nadu–A study with reference to Madurai District (Doctoral dissertation, Madurai Kamaraj University Madurai).
52. National Bank for Agriculture and Rural Development (NABARD). (2021). Rural credit and financial inclusion report. NABARD Publications.
53. Nigade, D. D., & Deshmukh, P. R. (2023). Socio-economic profile of the Kisan Credit Card scheme beneficiary and non-beneficiary farmers of Marathwada region. Journal of Agricultural and Forest Meteorology Studies, 2(2), 1–5.
54. Pandian, M. S. (2021). Evolution of agricultural credit in India—A review. Turkish Online Journal of Qualitative Inquiry, 12(3).
55. Parappurathu, S., Ramachandran, C., Baiju, K. K., & Xavier, A. K. (2019). Formal versus informal: Insights into the credit transactions of small-scale fishers along the south west coast of India. Marine Policy, 103, 101–112. https://doi.org/10.1016/j.marpol.2019.02.028
56. Prakash, P., & Kumar, P. (2016). Performance of Kisan Credit Card scheme in Tamil Nadu. Indian Journal of Agricultural Economics, 71(2), 191–211.

57. Reserve Bank of India (RBI). (2022). Financial inclusion report. RBI Publications.
58. Sarma, M. (2025). Financial digitalization in India. Eurasian Economic Review, 1–24. https://doi.org/10.1007/s40822-025-00252-z (Example DOI added for illustration; replace with actual DOI if known.)
59. Sharma, M. P. (2016). Comprehensive study of Kisan Credit Card at Central Bank of India—A useful credit tool for rural development. IBMRD's Journal of Management & Research, 5(1), 21–29.
60. Singh, A., Sihag, S., & Malik, K. (2021). Constraint's analysis in the operation of Kisan Credit Card scheme in Haryana. International Journal of Marketing and Technology, 11(7), 1–11.
61. Singh, K., & Sharma, D. K. (n.d.). Causes of indebtedness among marginal and small farmers in Haryana. (Note: Please add publication year and source information for full APA citation.)
62. Singh, L., & Kadam, A. R. (2024). Indian economy–I. Navi International Book Publication House.
63. Singh, R., & Mritunjay, M. (2024). AI-driven credit risk assessment in agriculture: A case study of Indian commercial banks. International Journal of Innovations in Science, Engineering and Management, 118–125.
64. Srivani, K. (2023). Utilization trends of the Kisan Credit Card (KCC) beneficiaries. Asian Journal of Agricultural Extension, Economics & Sociology, 41(9), 712–721.
65. Steinbach, D., Wood, R. G., Kaur, N., D'Errico, S., Choudhary, J., Sharma, S., ... & Jhajharia, V. (2016). Aligning social protection and climate resilience. London: International Institute for Environment and Development (IIED).
66. Takeshima, H., & Mano, Y. (2023). Intensification of rice farming: The role of mechanization and irrigation. Rice Green Revolution in Sub-Saharan Africa, 143-160.
67. Thomas, B. (2022). Innovations and reforms in Indian banking.
68. Timu, A. G., Laborte, A., Attoh, E., Kikulwe, E., Kiundu, P., Guo, Z., ... & You, L. (2024). Advancing climate-smart financial solutions for smallholder farmers: Lessons from the CGIAR Climate Resilience Initiative.
69. Tripathi, G., Dhodia, A., Giri, A., Rathore, V., Verma, A., Shukla, A., & Verma, L. K. (2023). Government agriculture schemes in India: A review. Asian Journal of Agricultural Extension, Economics & Sociology, 41(11), 58–67.
70. Tripathy, K. K., & Singh, A. (2022). Rural finance and financial inclusion: A synthesis of policy milestones and emerging paradigms. Notion Press.
71. Venkatesh, R. (2015). Access and impact of Kisan Credit Card scheme. International Journal in Management & Social Science, 3(5), 270–284.