ISSN Online: 3006-4708
SOCIAL SCIENCE REVIEW ARCHIVES ISSN Print: 3006-4694
https://policyjournalofms.com

# Impact of Financial Literacy On Agricultural Credit Accessibility Among Farmers in Punjab, Pakistan

**Aqsa Tabbasum[1], Hasan Zulfiqar [2], Haider Ali [3], Malika Sarfraz [4]**

[1] M.Phil. Scholar, Institute of Agricultural and Resource Economics, University of Agriculture Faisalabad Email: aqsatabbasum4122@gmail.com
[2] Lecturer, Institute of Agricultural and Resource Economics, University of Agriculture Faisalabad Email: hasan.zulfiqar@uaf.edu.pk
[3] M.Phil. Scholar, Department of Rural Sociology, University of Agriculture Faisalabad
[4] M.Phil. Scholar, Department of Rural Sociology, University of Agriculture Faisalabad

***DOI: https://doi.org/10.70670/sra.v3i3.988***

## Abstract

Agriculture plays a crucial role in global economic stability, food security, and poverty alleviation, especially in developing countries. In Pakistan, the sector contributes significantly to GDP and employment, with Punjab serving as the leading agricultural province, often termed the nation's "breadbasket." Despite its importance, smallholder farmers in Punjab face persistent barriers to accessing formal credit, primarily due to limited financial awareness, lack of collateral, and mistrust in financial institutions. This study investigates the impact of financial literacy on agricultural credit accessibility among smallholder farmers in rural Punjab. Primary data were collected from 140 respondents across Multan, Gujranwala, and Faisalabad using a structured questionnaire and stratified random sampling. Data analysis was conducted using descriptive statistics, cross-tabulation, and binary logistic regression in SPSS. Findings indicate that financial literacy and education are strong, statistically significant predictors of formal credit access, while age shows a negative correlation. Other variables, including land ownership, farming experience, and access to digital devices, were not significant in the regression model. Chi-square tests further confirmed significant associations between education, financial knowledge, and credit uptake. The study underscores the importance of integrating financial education into rural development programs to improve credit utilization and promote sustainable agricultural growth in Punjab.

**Keywords**: Financial literacy, credit accessibility, logistic regression, farmers, rural finance, Pakistan.

## Introduction

### Agriculture and Credit Constraints in Pakistan

Agriculture plays a central role in Pakistan's economy, contributing nearly 19% to GDP and employing around 42% of the labor force (Government of Pakistan, 2022). Punjab, the country's agricultural hub, sustains millions of households and provides a significant share of national food security. Despite its importance, the sector faces persistent challenges, particularly with respect to access to formal financial services. Smallholder farmers, who form the majority of cultivators, struggle to secure credit for purchasing inputs, adopting new technologies, and mitigating climate-related risks. Limited collateral, high transaction costs, and bureaucratic hurdles further constrain

financial access ((Etonihu, Umar, & Tsado, 2019); Hussain & Thapa, 2012; Raza, Rehman, & Shah, 2020; Lader, 2020). These limitations perpetuate low productivity and inhibit long-term resilience in rural economies.

**Financial Literacy as a Determinant of Credit Access**

Among the various barriers, financial literacy has emerged as a critical determinant of credit access. Financial literacy enables individuals to understand and manage financial resources effectively, make informed borrowing decisions, and interact confidently with financial institutions (Akram, Saeed, & Tariq, 2016; Ali, Shah, & Khan, 2018). Research suggests that farmers with higher financial awareness are more likely to open bank accounts, manage risk, and qualify for loans (Amin, Qureshi, & Khurshid, 2021; Rizvi & Qamar, 2020). These skills reduce the perceived risks for lenders while empowering borrowers to evaluate repayment capacity. By enhancing awareness of microfinance and government credit schemes, financial literacy broadens opportunities for rural farmers and reduces reliance on exploitative informal lenders (Chandio, Jiang, Wei, & Rehman, 2018; Zainab, Shahbaz, & Ahmed, 2020; Cook & Nixson, 2000).

Financial literacy also promotes resilience by equipping farmers to avoid excessive debt, plan long-term, and manage seasonal income variability. Farmers with financial knowledge are better able to cope with economic shocks, reduce the likelihood of default, and avoid unfavorable lending terms (Gaurav & Singh, 2012; Kurowski, 2021; Chang, Wang, & Zhang, 2022). This capacity supports sustainable farming and improves household well-being. Beyond individual benefits, financial literacy enhances institutional sustainability by reducing delinquency rates and increasing repayment performance (Lusardi & Mitchell, 2007, 2014). Agricultural growth has a stronger poverty-reducing effect than non-agricultural growth (De Janvry & Sadoulet, 2010).

**Broader Evidence from Developing Countries**

Evidence from other developing regions underscores the importance of financial literacy in promoting credit accessibility. Studies from India, Bangladesh, and China show that farmers with better financial skills are more likely to borrow formally and utilize loans productively (Cole, Sampson, & Zia, 2011; Giné & Mansuri, 2014; Feder, Lau, Lin, & Luo, 1990, 1992; Gao, Li, & Zhao, 2018; Gao, Li, & Zhou, 2020). Integrated financial education and training programs have been shown to improve repayment rates, enhance borrower confidence, and reduce information asymmetry between lenders and clients (Wagner, 2015; Zeller & Meyer, 2002). These insights are supported by evidence from microfinance institutions, which demonstrate that financial training enhances both client welfare and institutional sustainability.

Broader discussions of financial access highlight the intersection of credit with rural poverty, gender, and institutional barriers. Rural poverty in Pakistan, for instance, is linked to low agricultural productivity and exclusion from affordable credit (Sikandar, Hussain, & Sial, 2022; Christiaensen, Demery, & Kuhl, 2011). Studies also reveal that gendered constraints, such as unequal land rights, limit women's access to credit and agricultural resources, despite their significant role in farming (Ali, Deininger, & Goldstein, 2014; Tiruneh, Tesfaye, Mwangi, & Verkuijl, 2001; Udry, 1996). Addressing these disparities requires inclusive approaches that integrate financial literacy, institutional reforms, and gender-sensitive policy interventions. Furthermore, global experiences highlight how agricultural subsidies and transnational corporate control can distort credit markets, reducing competitiveness in low-income contexts (Tobias, 2006; Panait, Bărbulescu, & Socoliuc, 2020). Sustainable finance models, such as green credit, have been shown to simultaneously promote productivity and ecological resilience (Constantin, Yahya, & Shahbaz, 2021).

**Research Gap and Study Objective**

Despite government initiatives such as subsidized loans and microfinance schemes, access to

agricultural credit in Punjab remains uneven. Many smallholders lack the literacy skills necessary to navigate formal financial systems, leaving them excluded even when programs exist (Iqbal, Mahmood, & Younas, 2019; World Bank, 2014). Previous studies in Pakistan have largely focused on institutional inefficiencies, collateral requirements, and high borrowing costs (Raza *et al.*, 2020; Hussain & Thapa, 2012). Far less attention has been given to the behavioral and cognitive dimensions of credit access specifically, the role of financial literacy in shaping borrowing decisions and financial inclusion.

Punjab, as the largest agricultural province, presents a compelling case for this investigation. Regional disparities, limited financial literacy, and the exclusion of smallholder farmers highlight the need for empirical analysis (Khan & Gill, 2020; Akram, Hussain, & Abbas, 2008; Hassan, Aslam, & Rehman, 2019). By examining the relationship between financial literacy and agricultural credit accessibility, this study seeks to fill an important research gap. In doing so, it provides evidence-based insights for policymakers, financial institutions, and development practitioners striving to improve rural financial inclusion, enhance agricultural productivity, and promote poverty alleviation in Pakistan.

## Methodology

### Study Design and Sampling

A cross-sectional survey design was employed to collect primary data from 140 smallholder farmers in rural areas of Punjab, Pakistan. The districts were purposively selected to represent diverse agro-ecological conditions and farming practices, ensuring variation in exposure to financial services. Within these districts, respondents were chosen through stratified random sampling, allowing proportional representation of different farm sizes and production systems.

The sample size of 140 farmers was determined based on feasibility and adequacy for binary logistic regression analysis, consistent with recommendations by Gujarati (2004), Raza, Rehman, and Shah (2023), and Ali, Shah, and Khan (2018). This number was deemed sufficient to achieve statistical reliability while remaining practical for field implementation.

### Questionnaire Design and Data Collection

Data were collected using a structured questionnaire that covered demographic and socio-economic characteristics, financial literacy, and access to agricultural credit. The questionnaire was developed following the approach of Akram, Saeed, and Tariq (2016). To ensure validity, the instrument was reviewed by subject experts and pre-tested with 15 farmers in a non-sample district. Feedback from the pilot study led to minor revisions for improved clarity and contextual relevance.

### Ethical Considerations

Ethical approval for the study was obtained from the Research Ethics Committee of the University of Agriculture Faisalabad. Participation was voluntary, and verbal informed consent was obtained from all respondents before data collection. Farmers were assured of anonymity, and their responses were kept strictly confidential for research purposes only.

### Analytical Framework

Data analysis was carried out using descriptive and inferential statistics. Descriptive measures summarized socio-economic characteristics and credit access patterns. Chi-square tests were employed to examine associations between categorical variables.

To identify determinants of credit access, a binary logistic regression model was estimated. The dependent variable was dichotomous: access to formal agricultural credit (1 = accessed credit, 0 = no access). Independent variables included age, education, land ownership, farming experience, main source of income, smartphone access, financial literacy, and distance to the nearest bank.

The model's goodness-of-fit was evaluated using the Hosmer and Lemeshow test ($\chi^2 = 10.263$, $p = 0.247$), confirming that the logistic regression model adequately fit the observed data (Gujarati, 2004; Javed, Ali, & Ahmad, 2020).

## Results and Discussion

### Descriptive/Univariate Analysis

We analyzed each variable's central tendency using frequency, mean, mode, and standard deviation. This univariate analysis explores the socioeconomic characteristics relevant to the demographic dividend and their link to national development, as shown in the following percentages.

**Table 1**
**Distribution of Respondents by Education Level (N = 140)**

| Education Level | Frequency | Percentage |
|---|---|---|
| Illiterate | 65 | 46.4 |
| Primary | 38 | 27.1 |
| Secondary level | 29 | 20.7 |
| Higher level | 8 | 5.7 |
| Total | 140 | 100.0 |

**Source:** Authors own Findings

Table 1 shows nearly half of the respondents (46.4%) are illiterate, while only 5.7% have higher education. This indicates a major barrier to financial literacy, with most farmers needing simplified, practical, and possibly visual financial education. Education clearly influences the ability to access and use formal credit, reinforcing the need for inclusive, literacy-sensitive financial programs.

**Table 2**
**Access to Smartphone or Computer (N = 140)**

| Smartphone or computer | Frequency | Percentage |
|---|---|---|
| Yes | 110 | 78.6 |
| No | 30 | 21.4 |
| Total | 140 | 100.0 |

**Source:** Authors own Findings

Table 2 shows that 78.6% of respondents have access to a computer or smartphone, while 21.4% do not. This indicates strong digital connectivity, enabling access to mobile banking, financial education, and agricultural market platforms. However, the 21.4% without access remain digitally excluded, underscoring the need for digital literacy programs, agent banking, and affordable device access. Overall, the high connectivity suggests strong potential for expanding digital financial inclusion in the area.

**Table 3**
**Loan Acquisition Status (N = 140)**

| **Obtained a loan** | **Frequency** | **Percentage** |
|---|---|---|
| **Yes** | 105 | 75.0 |
| **No** | 35 | 25.0 |
| Total | 140 | 100.0 |

**Source:** Authors own Findings

Table 3 reveals that 75.0% of respondents obtained agricultural credit, while 25.0% did not indicating moderate access but ongoing barriers to financial inclusion. Reasons for non-access may include application rejection or eligibility issues. Regarding credit utilization, most respondents used loans for farm investment, suggesting productive intent. However, 28.6% used loans for household expenses, 17.9% for education, and 10.7% for other needs. This diversion highlights financial pressure, where credit meant for agriculture supports broader household needs. The findings underscore the need for accessible, flexible loan products, paired with financial literacy and planning support to ensure credit enhances both productivity and resilience.Top of Form

**Table 4**
**Self-Reported Financial Knowledge (N = 140)**

| **Financial Knowledge** | **Frequency** | **Percentage** |
|---|---|---|
| Yes | 11 | 7.9 |
| No | 129 | 92.1 |
| Total | 140 | 100.0 |

**Source:** Authors own Findings

Table 4 reveals a significant gap in financial literacy: 92.1% of respondents reported lacking financial knowledge, while only 7.9% claimed adequate understanding. This highlights a major obstacle to financial inclusion. Limited financial awareness can lead to poor loan management, low savings, and dependence on informal lenders. As Lusardi and Mitchell (2007) note, financial illiteracy hampers informed decision-making on credit and investment. These findings emphasize the urgent need for financial literacy programs covering budgeting, credit use, and savings. Enhancing financial knowledge is essential not only for individual well-being but also for the sustainability of rural credit systems and agricultural development.

**Cross tabulation:**

Cross-tabulation helps identify relationships between categorical variables. In this study, it was used to examine links between education, land ownership, digital access, and credit accessibility. Chi-square tests were employed to guide variable selection for regression analysis (Akram, Saeed, & Tariq, 2016; Ali, Shah, & Khan, 2018).

**Table 5: Loan Access by Financial Knowledge**

| **Financial Knowledge** | **Obtained Loan (Yes)** | **Obtained Loan (No)** | **Total** |
|---|---|---|---|
| Yes | 13 | 2 | 15 |
| No | 92 | 33 | 125 |
| Total | 105 | 35 | 140 |

**Source:** Authors own Findings

**Interpretation:** Financially literate respondents were more likely to access loans. This supports Lusardi and Mitchell (2007), who showed financial knowledge is crucial for effective credit use.

**Table 6: Loan Access by Land Ownership**

| **Land Ownership** | **Obtained Loan (Yes)** | **Obtained Loan (No)** | **Total** |
|---|---|---|---|
| Yes | 105 | 0 | 105 |
| No | 0 | 35 | 35 |
| Total | 105 | 35 | 140 |

**Source:** Authors own Findings

**Interpretation:** All respondents who owned land obtained loans, while none of the landless did. This suggests that land ownership is a critical factor in securing formal credit consistent with the findings of Feder, Lau, Lin, and Luo (1988), who emphasized the importance of land as collateral in rural credit access.

**Table 7: Loan Access by Smartphone Ownership**

| Access to Smartphone | Obtained Loan (Yes) | Obtained Loan (No) | Total |
|---|---|---|---|
| Yes | 78 | 32 | 110 |
| No | 27 | 3 | 30 |
| Total | 105 | 35 | 140 |

**Source:** Authors own Findings

**Interpretation:** Respondents with smartphone access had higher rates of loan acquisition, reflecting digital access as a facilitator of financial inclusion. This supports the findings of Demirgüç-Kunt, Klapper, Singer, and Van Oudheusden (2018), who linked digital connectivity with improved access to financial services.

**Binary Logistic Regression Model**

Binary logistic regression models the relationship between a binary outcome (e.g., access to credit) and various independent variables. It estimates the probability of an event using the logistic function. In this study, the method identifies key factors affecting farmers' credit access, assessing each variable's significance and alignment with existing literature. It is well-suited for analyzing categorical outcomes in agricultural research (Gujarati, 2004; Javed, Ali, & Ahmad, 2020).

**Dependent variable:** Access to Agricultural Credit: The dependent variable, coded as:

- 1 = Accessed formal credit
- 0 = Did not access formal credit

This variable represents whether the farmer successfully obtained formal agricultural credit in the past three years.

Table 8: Binary Logistic Regression

| **Variable** | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| **Age** | -2.333 | 0.724 | 10.381 | 1 | 0.001 | 0.097 |
| **Education** | 2.542 | 0.580 | 19.187 | 1 | 0.000 | 12.706 |
| **Land ownership** | 0.013 | 1.559 | 0.000 | 1 | 0.993 | 1.013 |
| **Farming Experience** | -0.002 | 0.028 | 0.008 | 1 | 0.930 | 0.998 |
| **Agri. Main source of income** | -0.516 | 1.100 | 0.220 | 1 | 0.639 | 0.597 |
| **Access to smart device** | 1.227 | 1.176 | 1.089 | 1 | 0.297 | 3.411 |
| **Financial literacy** | 5.667 | 1.499 | 14.287 | 1 | 0.000 | 289.087 |
| **Distance to bank** | 0.432 | 0.611 | 0.499 | 1 | 0.480 | 1.540 |
| **Constant** | -6.608 | 2.085 | 10.046 | 1 | 0.002 | 0.001 |

**Source:** Authors own Findings

**Table 9**
**Model Summary Statistics**

| **Statistic** | **value** |
|---|---|
| -2 Log Likelihood | 62.34 |
| Cox & Snell $R^2$ | 0.41 |
| Nagelkerke $R^2$ | 0.56 |
| Classification Accuracy | 83.6% |
| Hosmer–Lemeshow $\chi^2$ (8) | 10.263 |
| p-value | 0.247 |

**Source:** Authors' own findings

## Interpretation of Model Variables

**Age:**
The analysis revealed a significant negative relationship between age and credit accessibility (B = -2.333, p = 0.001), indicating that older farmers are less likely to access formal credit services. This may be due to increased risk perception by lenders or the reluctance of older farmers to engage with modern financial systems. This finding is consistent with Abdullah, Khalid, and Mahmood (2019), who observed that younger farmers in Pakistan had greater access to credit due to their openness to financial tools and digital literacy. However, it contrasts with Oluoch, Atieno, and Odhiambo (2018), who reported that older farmers in Kenya had greater access due to long-standing relationships with financial institutions.

**Education:**

Education had a significant positive impact on credit accessibility (B = 2.542, p = 0.000), with educated farmers being over 12 times more likely to access credit compared to uneducated ones. This supports the idea that education enhances financial awareness, confidence, and the ability to fulfill loan requirements. The result is consistent with Agrawal and Bhattacharya (2019), who found that educated farmers in India showed better interaction with banks. It also aligns with Mushtaq, Farooq, and Ahmad (2021), who reported that education improves credit documentation and trustworthiness in Punjab, Pakistan.

**Land Ownership:**

Land ownership had a positive but non-significant effect on credit access (B = 0.013, p = 0.993), suggesting that owning land did not significantly influence farmers' likelihood of obtaining credit. This finding contrasts with Nuryartono, Zeller, and Schwarze (2005), who emphasized that land ownership facilitates access through its use as collateral. However, it is partially supported by Iqbal, Shah, and Khan (2020), who argued that land must be formally registered and appropriately valued to impact credit access a condition that may not have been fulfilled by many farmers in this study.

**Farming Experience:**

Farming experience showed a very weak and non-significant relationship with credit access (B = -0.002, p = 0.930). This implies that the number of years spent in farming does not influence a farmer's chances of obtaining credit. This result aligns with Ayamga, Sarpong, and Asuming-Brempong (2007), who also found no significant influence of farming experience on access to credit in Ghana. However, it contrasts with Simtowe and Zeller (2006), who reported a positive association, attributing it to experienced farmers having a stronger reputation and credit history.

**Agriculture as Main Source of Income:**

Having agriculture as the primary income source had a negative but non-significant effect on credit access (B = -0.516, p = 0.639). This suggests that full-time involvement in agriculture does not necessarily enhance credit accessibility. This finding is inconsistent with Akram, Raza, and Zia (2022), who reported that full-time farmers in Pakistan typically demand and secure more credit for production activities. The discrepancy may be due to the limited profitability of agriculture or the possibility that credit institutions do not prioritize farming as a stable income source.

**Access to Smart Device:**

Access to a smart device had a positive but statistically non-significant effect on credit access (B = 1.227, p = 0.297). While farmers with smart devices were more likely to access credit, the effect was not strong enough to be conclusive. This result is partially consistent with Alkire, Kanagaratnam, and Suppa (2020), who stressed that digital tools alone are insufficient without adequate user training. However, it contrasts with Njuguna and Mwangi (2019), who reported that smart devices significantly improved access to credit through mobile banking and digital services in Kenya.

**Financial Literacy:**

Financial literacy emerged as the most powerful and statistically significant predictor of credit access (B = 5.667, p = 0.000), with an odds ratio of 289.087. This indicates that financially literate farmers are substantially more likely to obtain credit. The result is highly consistent with Barrett, Islam, and Islam (2018) and Xie, Deng, and Ma (2016), both of whom emphasized that financial literacy improves rural financial behavior, enhances trust in financial systems, and equips farmers with the skills needed to navigate loan procedures.

**Distance to Bank:**

The distance to the nearest bank showed a positive but non-significant relationship with credit access (B = 0.432, p = 0.480). This is a somewhat unexpected result, as prior literature typically found that greater distance reduces access due to transportation costs and inconvenience. However, it may be

partially consistent with Demirgüç-Kunt, Klapper, Singer, and Van Oudheusden (2018), who noted that the emergence of mobile banking and agent-based models has reduced the importance of physical proximity to financial services.

**Table 3.1: Hosmer and Lemeshow Test**

| Step | Chi-square | df | Sig. |
|---|---|---|---|
| 1 | 10.263 | 8 | .247 |

**Source:** Authors own Findings

The Hosmer and Lemeshow Test assessed the model's goodness-of-fit, yielding a Chi-square = 10.263, df = 8, and p = 0.247. Since the p-value is greater than 0.05, the test indicates a good model fit, suggesting that the predicted outcomes align well with the observed data.

**Conclusion and Policy Implications**

This study examined the role of financial literacy in improving access to agricultural credit among smallholder farmers in Punjab, Pakistan. Using structured survey data and binary logistic regression, the findings confirm that financial literacy is a strong and statistically significant predictor of credit access. Farmers with knowledge of basic financial concepts such as interest rates, budgeting, and repayment terms were far more likely to secure loans than those lacking such skills.

The results also highlight critical gaps: most farmers reported low financial literacy, with many relying on informal lenders at exploitative rates. Education emerged as another key determinant, enabling better navigation of loan processes, while age showed a negative association, with younger farmers more likely to access credit. Although land ownership, farming experience, and smartphone access were not statistically significant, their practical importance remains, particularly in shaping perceptions of creditworthiness and potential for digital financial inclusion.

A notable finding was the diversion of agricultural loans toward household needs, reflecting broader financial pressures. This underscores the need for flexible credit products that balance consumption and investment demands. Overall, the study demonstrates that expanding financial literacy, alongside more inclusive and adaptable credit policies, is essential for enhancing rural financial inclusion, strengthening agricultural productivity, and reducing dependence on informal lenders.

**Policy Implications**

The findings suggest several actionable steps for policymakers and financial institutions:

1. Integrating Financial Literacy into Extension Services
   Incorporate financial education into agricultural extension programs, covering budgeting, credit use, repayment planning, and savings.

2. Bundling Training with Agricultural Loan Products
   Require short financial literacy sessions as part of loan disbursement to ensure farmers fully understand terms and obligations.

3. Designing Literacy-Sensitive Credit Programs
   Simplify documentation, use visual repayment guides, and provide community-based assistance to improve accessibility for low-literacy farmers.

4. Leveraging Digital Platforms
   Expand mobile banking and app-based financial education, supported by digital literacy programs, particularly for older farmers.

5. Developing Inclusive Credit Models for Vulnerable Groups
   Promote alternatives to land-based collateral—such as group lending or cooperative guarantees—to improve access for landless farmers, women, and tenants.

6. Bridging Generational Gaps
   Launch targeted outreach and simplified processes for older farmers, who are less likely to engage with modern financial services despite greater farming experience.

7. Improving Monitoring and Flexibility in Loan Use
   Design loan packages that accommodate both productive investment and essential household needs, ensuring credit contributes to resilience and sustainability.

By embedding financial literacy into rural development strategies and adapting loan products to farmer realities, policymakers can strengthen financial inclusion, enhance agricultural productivity, and improve the resilience of rural communities in Pakistan.

## References


Abdullah, I., Khalid, R., & Mahmood, T. (2019). Determinants of agricultural credit access in Pakistan: Empirical evidence from smallholder farmers. Journal of Agricultural Economics Research, 57(1), 89–101.

Agrawal, A., & Bhattacharya, S. (2019). The influence of education on agricultural credit use in India. Indian Journal of Economics and Development, 15(2), 117–125.

Akram, W., Hussain, A., & Abbas, K. (2008). Regional disparities in agricultural credit disbursement in Punjab. Pakistan Development Review, 47(4), 481–498.

Akram, W., Saeed, K., & Tariq, S. (2016). Determinants of access to credit and its impact on household income in Pakistan. Pakistan Journal of Agricultural Sciences, 53(2), 469–475.

Akram, W., Raza, A., & Zia, S. (2022). Economic resilience and food security nexus in rural Pakistan. Pakistan Journal of Agricultural Sciences, 59(3), 455–463.

Ali, D. A., Deininger, K., & Goldstein, M. (2014). Environmental and gender impacts of land tenure regularization in Africa: Pilot evidence from Rwanda. Journal of Development Economics, 110, 262–275.

Ali, A., Shah, H., & Khan, M. (2018). Financial inclusion and access to credit: The role of financial literacy. Pakistan Economic and Social Review, 56(1), 1–20.

Amin, A., Qureshi, S., & Khurshid, F. (2021). Financial knowledge and access to formal credit: Evidence from rural households in Pakistan. Journal of Financial Inclusion and Development, 9(1), 45–62.

Ayamga, M., Sarpong, D. B., & Asuming-Brempong, S. (2007). Factors influencing the decision to participate in micro-credit programs: A case study in Northern Ghana. Ghana Journal of Agricultural Economics, 3(2), 31–45.

Barrett, C. B., Islam, A., & Islam, S. (2018). The financial literacy and credit behavior of farmers in

low-income countries. Journal of Development Studies, 54(8), 1362–1379.
Chandio, A. A., Jiang, Y., Wei, F., & Rehman, A. (2018). Impact of financial development and institutional quality on agricultural productivity in Pakistan: New evidence using ARDL approach. Sustainability, 10(10), Article 3547. https://doi.org/10.3390/su10103547
Chang, Y., Wang, X., & Zhang, M. (2022). Financial literacy and decision-making among rural households. Asian Journal of Finance & Accounting, 14(1), 88–102.
Christiaensen, L., Demery, L., & Kuhl, J. (2011). The (evolving) role of agriculture in poverty reduction: An empirical perspective. Journal of Development Economics, 96(2), 239–254.
Cole, S., Sampson, T., & Zia, B. (2011). Prices or knowledge? What drives demand for financial services in emerging markets? The Journal of Finance, 66(6), 1933–1967.
Constantin, A., Yahya, M., & Shahbaz, R. (2021). Financial resilience and the food system in fragile economies. International Journal of Agricultural Management, 10(1), 23–31.
Cook, P., & Nixson, F. (2000). Finance and small and medium-sized enterprise development. Finance and Development Studies, 6(1), 245–265.
De Janvry, A., & Sadoulet, E. (2010). Agricultural growth and poverty reduction: Additional evidence. World Bank Research Observer, 25(1), 1–20.
Demirgüç-Kunt, A., Klapper, L., Singer, D., & Van Oudheusden, P. (2018). The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution. World Bank.
Etonihu, K. I., Umar, M., & Tsado, A. (2019). Impact of credit policy on agricultural production in Nigeria. Journal of Agricultural Finance and Development, 6(1), 55–68.
Feder, G., Lau, L. J., Lin, J. Y., & Luo, X. (1990). The relationship between credit and productivity in Chinese agriculture: A microeconomic model of disequilibrium. American Journal of Agricultural Economics, 72(5), 1151–1157.
Feder, G., Lau, L. J., Lin, J. Y., & Luo, X. (1988). *The relationship between credit and productivity in Chinese agriculture: A microeconomic model of disequilibrium*. American Journal of Agricultural Economics, 70(1), 37–49.
Feder, G., Lau, L. J., Lin, J. Y., & Luo, X. (1992). Agricultural credit and farm performance in China. Journal of Comparative Economics, 16(2), 328–346.
Gao, Y., Li, H., & Zhao, Z. (2018). Rural finance and sustainable development: Evidence from China. Journal of Agricultural Policy and Economics, 10(2), 98–115.
Gao, Y., Li, L., & Zhou, Z. (2020). Credit accessibility and agricultural investment: Evidence from rural China. China Agricultural Economic Review, 12(4), 567–583.
Gaurav, S., & Singh, A. (2012). An inquiry into the financial literacy and cognitive ability of farmers: Evidence from rural India. Oxford Development Studies, 40(3), 358–380.
Giné, X., & Mansuri, G. (2014). Money or ideas? A field experiment on constraints to entrepreneurship in rural Pakistan. World Bank Policy Research Working Paper, No. 6959.
Gujarati, D. N. (2004). Basic econometrics (4th ed.). McGraw-Hill.
Government of Pakistan. (2022). *Pakistan economic survey 2021–22*. Ministry of Finance, Islamabad.
Hassan, M., Aslam, H. D., & Rehman, A. (2019). Financial literacy and financial inclusion: Evidence from Pakistan. International Journal of Financial Research, 10(2), 234–245.
Hussain, A., & Thapa, G. B. (2012). Smallholders' access to agricultural credit in Pakistan. Food Security, 4(1), 73–85.
Iqbal, F., Mahmood, Z., & Younas, M. (2019). Financial literacy and SME performance in Pakistan. Journal of Business and Management Studies, 5(2), 89–97.
Iqbal, M. S., Shah, B. H., & Khan, A. M. (2020). Land tenure and access to agricultural credit: Evidence from Pakistan. Land Use Policy, 90, 104265.
Javed, M. I., Ali, S., & Ahmad, R. (2020). Role of microfinance and financial literacy in access to credit in rural Pakistan. Pakistan Journal of Agricultural Research, 33(3), 597–604.

Khan, M. A., & Gill, A. R. (2020). Smallholder farmers' access to finance in Punjab: A case study. South Asian Journal of Economic Policy, 11(1), 43–55.
Kurowski, D. (2021). Financial behavior of agricultural households: Evidence from Eastern Europe. Agricultural Economics Review, 22(1), 45–60.
Lader, P. (2020). Credit constraints in rural entrepreneurship: Insights from smallholders in Kenya. Journal of Rural Economic Development, 14(1), 25–40.
Lusardi, A., & Mitchell, O. S. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education. Business Economics, 42(1), 35–44.
Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. Journal of Economic Literature, 52(1), 5–44.
Mansuri, G. (2014). Entrepreneurship in rural Pakistan: A randomized control trial. World Bank Economic Review, 28(3), 379–406.
Mushtaq, R., Farooq, A., & Ahmad, N. (2021). Does education affect farmers' access to institutional credit in Punjab, Pakistan? Pakistan Journal of Social Sciences, 41(1), 123–133.
Njuguna, A., & Mwangi, I. (2019). Digital credit, mobile phones, and financial access in Kenya. Journal of African Financial Studies, 4(1), 67–84.
Nuryartono, N., Zeller, M., & Schwarze, S. (2005). Credit rationing of farm households and agricultural production: Empirical evidence in the rural areas of Central Sulawesi, Indonesia. Conference on International Agricultural Research for Development.
Oluoch, P. A., Atieno, R., & Odhiambo, W. (2018). Determinants of access to credit by smallholder farmers in Kenya. African Journal of Agricultural Economics, 5(1), 1–11.
Panait, M., Bărbulescu, G., & Socoliuc, M. (2020). Transnational corporations and rural finance: Impacts on food security. International Journal of Agricultural Policy, 5(2), 33–47.
Raza, M. A., Rehman, S., & Shah, T. (2020). Agricultural credit and smallholder farming: Evidence from Punjab, Pakistan. Journal of Rural Finance and Development, 7(1), 15–25.
Raza, M. A., Rehman, S., & Shah, T. (2023). Impact of financial literacy on credit access among rice farmers in Pakistan. Journal of Rural Development and Agriculture, 8(1), 21–30.
Rizvi, S. A., & Qamar, A. (2020). The role of financial literacy in promoting financial inclusion in rural Pakistan. Journal of Development Finance, 11(2), 144–158.
Sikandar, T., Hussain, A., & Sial, N. (2022). Rural poverty, credit constraints, and agricultural finance in Pakistan. Pakistan Journal of Social Development, 13(1), 49–65.
Simtowe, F., & Zeller, M. (2006). The impact of access to credit on the adoption of hybrid maize in Malawi: An empirical test using matching techniques. International Association of Agricultural Economists Conference Paper.
Tiruneh, A., Tesfaye, T., Mwangi, W., & Verkuijl, H. (2001). Gender differentials in agricultural production and decision-making among smallholders in Ada, Ethiopia. International Maize and Wheat Improvement Center (CIMMYT).
Tobias, A. (2006). Agricultural subsidies and their impact on rural credit: A global perspective. Journal of Agricultural Policy and Research, 3(2), 101–115.
Udry, C. (1996). Gender, agricultural production, and the theory of the household. Journal of Political Economy, 104(5), 1010–1046.
Wagner, J. (2015). Financial literacy and borrower behavior in rural Pakistan. Pakistan Journal of Social and Behavioral Sciences, 9(4), 115–129.
World Bank. (2014). Global financial development report 2014: Financial inclusion. World Bank.
Xie, W., Deng, X., & Ma, C. (2016). The impact of financial literacy on farmer entrepreneurship in China. China Agricultural Economic Review, 8(1), 118–136.
Zainab, S., Shahbaz, M., & Ahmed, R. (2020). Financial literacy and the likelihood of formal borrowing: Evidence from rural Pakistan. Pakistan Journal of Social and Economic Policy, 12(2), 35–49.

Zeller, M., & Meyer, R. (2002). The triangle of microfinance: Financial sustainability, outreach, and impact. International Food Policy Research Institute.