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CLUSTER AS A STRATEGY TO IMPROVE ACCESS TO FINANCING AND PRODUCTIVITY FOR SMALL-SCALE FARMERS: A LITERATURE REVIEW

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ABSTRACT
The objective of this research was to analyze how the cluster facilitates access to funding and contributes to increased productivity of smallholder farmers. This study is a literature review. Data collection was done through an exhaustive search of the Scopus and Scielo databases, selecting a total of 30 relevant articles. From the analysis of the reviewed documentation, it was concluded that most of the prevailing research presents a quantitative approach. Among the common findings, it was identified that agricultural clusters facilitate access to credit by improving trust between producers and financial institutions. In addition, it was emphasized that associativity within clusters optimizes financing and reduces production costs, thereby increasing the competitiveness of the agricultural sector. However, to ensure the success of clusters in accessing credit, it is essential to strengthen the financial education of producers, implement supportive public policies and promote the digitization of financial services. The structuring of cooperation and sustainable financial networks will be key to the economic development and financial inclusion of smallholders.

Keywords: Agricultural cluster, access to credit, financial development.

RESUMEN
El objetivo de esta investigación fue analizar cómo el clúster facilita el acceso al financiamiento y contribuye al incremento de la productividad en pequeños agricultores. Este estudio es una investigación de revisión de literatura. La recopilación de datos se llevó a cabo mediante una búsqueda exhaustiva en las bases de datos Scopus y Scielo, seleccionándose un total de 30 artículos relevantes. Del análisis de la documentación revisada, se concluye que la mayoría de las investigaciones predominantes presentan un enfoque cuantitativo. Entre los hallazgos comunes, se identificó que los clústeres agrícolas facilitan el acceso al crédito al mejorar la confianza entre productores y entidades financieras. Además, se destaca que la asociatividad dentro de los clústeres permite optimizar el financiamiento y reducir los costos de producción, incrementando la competitividad del sector agrícola. Sin embargo, para garantizar el éxito de los clústeres en el acceso al crédito, es fundamental fortalecer la educación financiera de los productores, implementar políticas públicas de apoyo y fomentar la digitalización de los servicios financieros. La estructuración de redes de cooperación y financiamiento sostenible será clave para el desarrollo económico y la inclusión financiera de los pequeños agricultores.
Palabras claves:Clúster agrícola, acceso al crédito, desarrollo financiero.

INTRODUCTION

Farmers encounter challenges in accessing credit due to a lack of collateral, informality, and high interest rates, which limits their investment in technology and competitiveness. Similarly, the phenomenon of associativity is susceptible to the influence of mistrust and organizational challenges, thereby diminishing its efficacy. To address these challenges, the implementation of policies that facilitate credit and promote the efficient operation of agricultural cooperatives is imperative.

On a global scale, access to credit represents a significant challenge for farmers, with approximately 30% of producers in developing countries excluding formal financing, thereby limiting their investment capacity (World Bank, 2021). Furthermore, 40% of smallholder farmers encounter challenges in meeting banking requirements due to a lack of collateral or credit history (Haryanto et al., 2023). Despite the existence of government programs, only 15% of rural farmers have access to long-term credit, which negatively impacts their competitiveness (World Bank, 2021). The enhancement of market and financing opportunities is a notable consequence of associativity, as evidenced by the observation that 60% of farmers in cooperatives attain more advantageous pricing and negotiating terms (UNCTAD, 2020). However, only 25% of farmers in developing countries actively participate in associations due to mistrust and a lack of institutional support (Sanabria Neira et al., 2024).

In Latin America, financing remains a critical issue, with more than 40% of smallholder farmers lacking access to formal credit in countries such as Mexico and Brazil (ECLAC, 2021). While 25% of producers secure financing at competitive rates, the majority encounter obstacles that create a disadvantageous environment compared to large producers (González and Robles, 2022). Cooperatives have played a pivotal role in this region, with 40% of the countries surveyed, including Colombia, Brazil, and Peru, reporting their involvement. However, a mere 20% of these associations receive adequate financial support, thereby constraining their impact (Ministry of Agriculture, 2021). In Chile, the Caja de Crédito Agrario has facilitated financing for small farmers, while in Ecuador, the absence of clear policies has fostered dependence on informal loans with high interest rates (Asencio-Cristóbal et al., 2021).

In Peru, for instance, while 30% of farmers have access to formal credit, the absence of collateral and the prevalence of informal contracts continue to act as significant obstacles (Peruvian Ministry of Economy and Finance, 2024). Notwithstanding the implementation of government programs, a significant proportion of producers, exceeding 50%, fail to meet the stipulated requirements. The concept of associativity has been identified as a pivotal factor in enhancing agricultural competitiveness. According to MIDAGRI (2021), 35% of farmers are affiliated with cooperatives. However, it is noteworthy that only 15% of these cooperatives possess the necessary organizational framework and financial resources. The absence of adequate training and institutional support hinders their growth, despite their capacity to enhance market access (Mendoza-Vela, 2023).

Similarly, agricultural clusters have been shown to facilitate the transfer of knowledge and financing, thereby increasing productivity by up to 20% over a five-year period through the integration of producers and technology (López, 2022). Moreover, effective coordination between state entities, academic institutions, and business entities is imperative to enhance the sustainability of the sector (Tique and Barrientos, 2023). However, the informal nature of agriculture has been shown to impede access to credit, thereby affecting the financial development of producers (Tique and Barrientos, 2023).

Conversely, credit and associativity have been identified as pivotal factors in enhancing agricultural productivity. However, the stringent requirements and absence of guarantees impose constraints on investment in technology and productive enhancements (Mendoza-Vela, 2023). In this regard, public policies that facilitate credit and promote cooperation could strengthen the sector, improve competitiveness, and contribute to its economic sustainability (MIDAGRI, 2021; Mendoza-Vela, 2023).

The present article addresses the issue of farmers' access to credit and the importance of associativity in this context, emphasizing its relevance for the development of the agricultural sector. The objective of this analysis is to comprehend how the cluster enables access to finance and contributes to increased productivity among small farmers. The significance of this issue is predicated on the role of credit as a pivotal catalyst in empowering farmers to enhance their production processes, acquire quality input, and thereby augment their competitiveness in the market. Nevertheless, numerous farmers encounter challenges in accessing credit due to a lack of collateral, high interest rates, or a lack of awareness regarding available options.

THEORETICAL BACKGROUND

The present study is supported by several theoretical frameworks, including cluster theory, access to credit, Amartya Sen's economic development theory, and association. These theoretical frameworks are deemed essential for comprehending the dynamics of economic and social development. Firstly, as Michael Porter's cluster theory demonstrates, the strategic importance of concentrating related companies geographically is evident. This concentration fosters enhanced competitiveness and innovation (Pillihuamán, 2024). According to Porter's theory, the proximity of companies within a sector facilitates the creation of collaborative networks and the exchange of knowledge, which, in turn, reduces production costs and improves productivity (Lomsadze, 2023). Furthermore, the phenomenon of geographical specialization has been demonstrated to foster a perpetual cycle of innovation and facilitate access to specialized resources (Zizka and Rydvalova, 2021). This theory has been applied in sectors such as technology and biotechnology, where the concentration of companies facilitates the exchange of resources and skills (Lomsadze, 2023). In the long term, it has played a pivotal role in the development of public policies that encourage both collaboration and competition, thereby promoting the economic growth of specific regions.

Secondly, the theory of access to credit addresses how the availability of financial resources influences economic development, particularly in contexts of poverty and inequality. The aforementioned theory was further developed through the contributions of George Akerlof and Michael Spence, who introduced seminal concepts such as asymmetric information and moral hazard (Ogunmokun et al., 2024). Akerlof's seminal work demonstrated that the absence of access to credit functions as a perpetuating factor in economic inequalities, as it hinders investment in opportunities for enhancement (Bernanke, 2023). This theory also analyzes how financial institutions can facilitate access to credit through more efficient risk assessment mechanisms, removing barriers for the most vulnerable sectors (Ndombi, 2022). In developing countries, enhancing access to credit is regarded as a pivotal strategy for promoting entrepreneurship, enhancing financial inclusion, and fostering economic growth.

Conversely, Amartya Sen's theory of economic development places significant emphasis on the concept of capability, which signifies the genuine opportunities available to individuals to attain a fulfilling life. Sen challenges the prevailing use of Gross Domestic Product (GDP) as a metric for economic advancement, proposing an alternative approach

that emphasizes the assessment of well-being based on individual freedoms and capabilities (Maceri and Srnec, 2018). According to Sen, development is not confined to economic growth; rather, it should concentrate on establishing conditions that empower individuals to select and accomplish their objectives (Svitych, 2024). This theoretical framework has exerted a considerable influence on international development policies, particularly in domains such as education, health, and gender equality (Ragkousis, 2024). For Sen, development is defined as the augmentation of individual capabilities and the elimination of barriers that impede individuals' opportunities (Riveros-Gavilanes, 2021).

In a similar vein, associativity theory underscores the significance of collaborative efforts among individuals or groups to attain shared objectives. Elinor Ostrom, a preeminent figure in this field, developed the concept of "commons," demonstrating how communities can manage their resources collectively and sustainably without state intervention (Lemke and Lofthouse, 2022). Ostrom's seminal work posits that communities possess the capacity to establish their own institutions, thereby facilitating the effective management of resources within a framework of collective rules and mutual trust (Mendoza-Vela, 2024). This theory has been applied to the management of water resources and fisheries, where local cooperation is essential for ensuring the sustainability of resources (Sabourin, 2023). It also underscores the significance of active engagement by local actors in decision-making processes, which has been demonstrated to enhance social capital and community cohesion (Murcia-Castillo & Francel-Delgado, 2022).

In this context, the concept of an agricultural cluster is defined as a productive grouping strategy that improves efficiency and competitiveness in the agricultural sector through cooperation between producers, financial institutions, and government agencies (Sánchez et al., 2020). This configuration fosters regional specialization, the generation of economies of scale, and the optimization of resource utilization (Anguiano-Pita and Ruiz-Porras, 2020). The formation of agricultural clusters has been demonstrated to facilitate access to markets, financing, and technology, thereby promoting the sustainable development of the sector (Becerra & Flores, 2023). Furthermore, they facilitate the integration of ancestral knowledge with technological innovations, thereby generating positive impacts on agricultural productivity (Zamora et al., 2018).

The foundational principle of agricultural associations is predicated on the notion of collaboration among producers, with the overarching objective of enhancing their access to financing, inputs, and markets (Mendoza-Vela, 2021). This organizational model has been demonstrated to enhance the bargaining power of small producers and to reduce intermediation costs in the marketing of agricultural products (Asencio-Cristóbal et al., 2021). The utilization of associative systems has been identified as a pivotal factor in the consolidation of agricultural clusters. These systems have been found to play a crucial role in facilitating the implementation of financial development policies and enhancing access to credit (Guarata and Ramírez, 2025). Furthermore, they have been shown to promote innovation and economic development in rural communities, with a positive impact on productivity (Riera, 2020).

Consequently, access to agricultural credit emerges as a pivotal instrument for the advancement of the sector, enabling producers to allocate resources toward investments in infrastructure, technological enhancements, and the expansion of activities (Anguiano-Pita and Ruiz-Porras, 2020). Nevertheless, persistent disparities in access to financial resources persist, predominantly impacting small-scale producers (Poaquiza-Cornejo et al., 2019). In this regard, financial development plays an essential role in the expansion of agricultural credit, facilitating a more equitable allocation of resources (Guarata and Ramírez, 2025).

However, for agricultural credit to achieve its objective of revitalizing the sector, it is imperative to fortify public policies and enhance the financial literacy of rural producers (Poaquiza-Cornejo et al., 2019).

METHOD

Type of study: This study is a literature review, compiling and analyzing previous studiesrelated to the topic. An exhaustive search was conducted to clearly and accurately summarize
the search and selection of studies.

Purpose of the review: This research sought to analyze how the cluster facilitates access to financing and contributes to increased productivity among small farmers.

Inclusion and exclusion criteria

- **Target population:** Agricultural producers.
- **Type of publications:** The literature review includes (articles in indexed journals, empirical studies, experimental studies, etc.) and those that will be excluded (editorial comments, reviews, studies without peer review).
- **Thematic content:** Articles addressing the impact of clusters on access to credit and financial development for agricultural producers. Table 1 shows the types of articles that have been reviewed: quantitative (19), qualitative (2), mixed (6), literature review (3).
- **Time range:** The search includes studies published between 2020 and March 2025.
- **Languages:** Studies in English and Spanish.

Data sources and search strategies

- **Databases:**The databases used for the search were Scopus and Scielo. These high-quality databases were used because they offer access to a wide range of peer-reviewed articles and relevant academic literature, ensuring the robustness and validity of the information for the literature review. Their use allows for a comprehensive and efficient search, facilitating the identification of key studies on the impact of clusters on access to credit and financial development for agricultural producers.
- **Search terms:**Key terms used for the search: “agricultural cluster,” “access to credit,” “financial development,” “agricultural producers,” “rural financing,” “agricultural economy,” “financial institutions,” “productive competitiveness.”
- **Search algorithm**

“agricultural cluster“ AND ‘access to credit’ AND ‘financial development’; ‘agricultural cluster’ OR ‘access to credit’ OR ‘financial development’; ‘agricultural cluster’ AND ‘access to credit’ AND (”financial development"); ‘agricultural cluster’ AND ”financial development” AND (“access to credit”); “access to credit” AND “financial development” AND (“agricultural cluster”); “access to credit” AND (“agricultural cluster” OR “financial development”).

Study selection process

- **Selection method:**First, an initial selection was made based on title and abstract, followed by a complete review of the text.
- **Relevance assessment:**Explain the criteria used to determine the relevance of each study.
- **Using the PRISMA diagram:**Figure 1 shows the PRISMA diagram illustrating the article selection and exclusion process.

A total of 473 studies were identified (253 from Scopus and 220 from Scielo). After grouping the results and eliminating 86 duplicates, a total of 387 publications were used.

After reviewing the abstracts of the 387 filtered publications, 163 articles were selected for final evaluation. The inclusion and exclusion criteria were then applied to filter the studies, excluding 133 studies that did not meet the criteria, leaving 30 for final analysis.

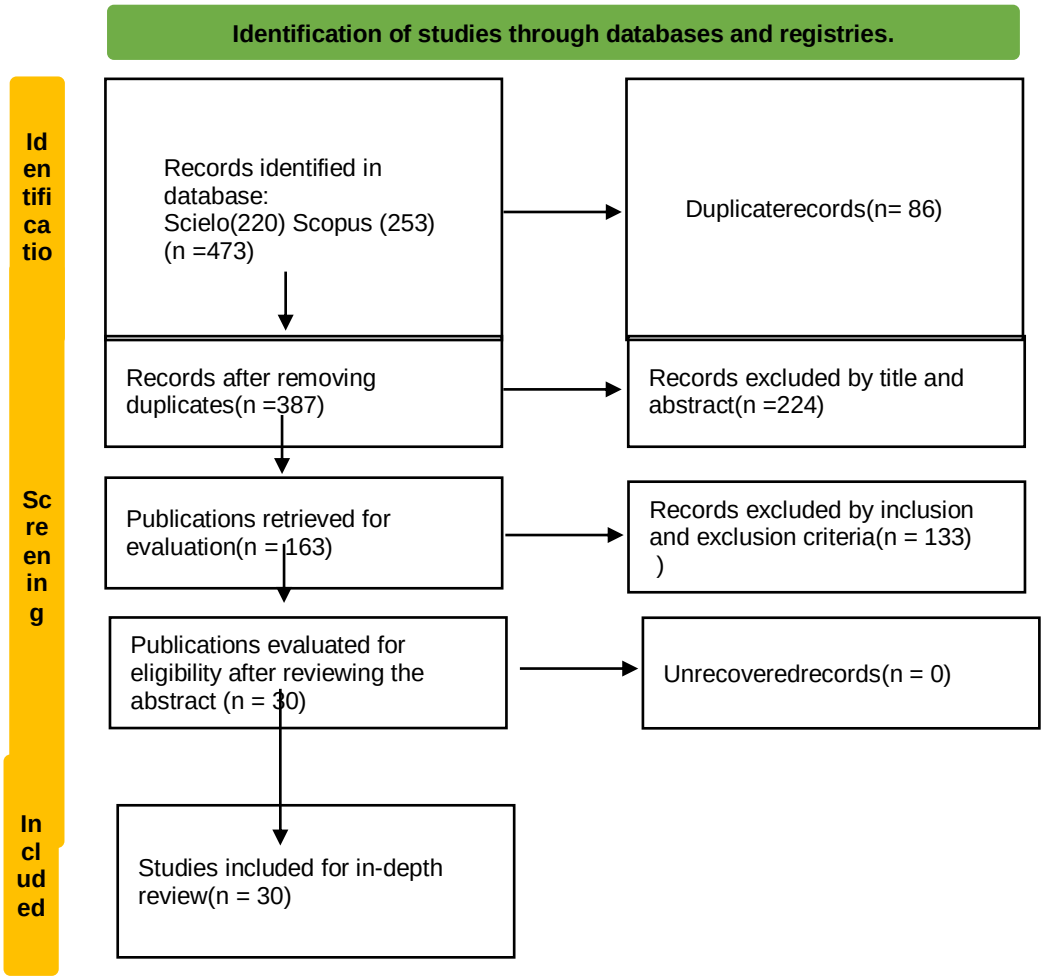

Fig. 1. PRISMA flow of journal articles through the systematic review process.

After applying the criteria, 30 complete publications were selected for systematic analysis, as shown in Table 1.

N°	Author	Article title	Methodology	Country	Year	Database
1	Gidelew, G. E., Alemu, B. A., & Kassie, K. E. (2024)	Impact of Cluster Agriculture on Rural Food Security in Ethiopia	Quantitative	Ethiopia	2024	Scopus
2	Otsuka, K., & Ali, M. (2020)	Strategies for the Transformation of Agricultural Clusters into Agro-Industries	Literature review	Pakistan	2020	Scopus
3	Zeleke, A. Z., &Wordofa, M. G. (2024)	Benefits of Cluster Agriculture for the Economy of Smallholder	Literature review	Ethiopia	2024	Scopus

		Farmers in Ethiopia				
4	Nawaz, M., & Avetisyan, M. (2025)	Imperfections in the Rural Credit Market and Their Influence on Climate Change Adaptation in Pakistan	Quantitative	Pakistan	2025	Scopus
5	Ertunç, E., &Karkinlı, A. E. (2021)	Groupings for Land Valuation and Consolidation	Quantitative	Turkey	2021	Scopus
6	Joffre, O. M., De, J. R., Klerkx, L., & Poortvliet, P. M. (2020)	The Role of Clusters in Technology Adoption in Vietnamese Aquaculture	Mixed	Vietnam	2020	Scopus
7	Nakano, Y., & Magezi, E. F. (2020)	Microcredit and Rice Productivity in Tanzania: Impact on Technology Adoption	Quantitative	Tanzania	2020	Scopus
8	Caruso et al. (2020)	New Methodology for Credit Risk Assessment Using Mixed Data Clustering	Mixed	Germany	2020	Scopus
9	Wang et al. (2023)	Portrait Model of Farmers According to Their Performance	Quantitative	China	2023	Scopus
10	Li et al. (2024)	Relationship between Credit Scores, Willingness to Pay, and Credit Default	Quantitative	China	2024	Scopus
11	Shano & Waje (2024)	Impact of Microcredit on Agricultural Technology Adoption in Ethiopia	Quantitative	Ethiopia	2024	Scopus
12	Lu et al. (2024)	Financial Literacy and its Relationship with Credit Default	Literature review	China	2024	Scopus
13	Kimaro et al. (2024)	Cooperative Irrigation Agriculture and its Relationship with Food Security	Mixed	Ethiopia	2024	Scopus
14	Witinok-Huber & Radil (2021)	Impact of Gender and Geography on Access to Agricultural Resources	Mixed	Liberia	2021	Scopus
15	Sánchez, A., & Sánchez, R., (2021)	The Avocado Cluster in Mexico. Sustained growth based on production and market development.	Quantitative	Mexico	2021	Scielo
16	Tongo, E., & Soplín, H. (2022)	Assessment of the sustainability of livestock production systems in the province of	Quantitative	Peru	2022	Scielo

		Oxapampa/Pasco/Peru.				
17	Paccioretti, P., Córdoba, M., & Balzarini, M. (2020)	Development of software for mapping spatial variability in agriculture and the environment.	Quantitative	Argentina	2020	Scielo
18	Aquino, V.,, Camarena, F., Julca, A., & Jiménez, J.. (2018)	Multivariate characterization of tarwi (Lupinus mutabilis Sweet) farms in the Mantaro Valley, Peru.	Mixed	Peru	2018	Scielo
19	Ayaviri-Nina, D., Romero-Flores, M., Fuentes-Gavilanez, L., Chiriboga-Zamora, P., & Sánchez-Cuesta, P.. (2022)	Microcredit in livestock and agricultural activities. A study from a territorial development perspective.	Qualitative	Ecuador	2022	Scielo
20	Rojas, L., Rojas, R., & Baylon, E. (2024)	AGRICULTURAL PRODUCTION FACTORS IN THE ECONOMIC GROWTH OF THE PASCO REGION DURING THE PERIOD 2012-2022.	Quantitative	Peru	2024	Scielo
21	Ferrer, R., Florida, N., Vargas, F., Ancobar, D., Alvarado, Y., & Maldonado, A. (2023)	Effect of financing on semi-ecological production and marketing of cocoa (Theobroma cacao) in Leoncio Prado, Peru.	Quantitative	Peru	2023	Scielo
22	Rivera-Acosta, Javier, & Xiuchuan, Xu. (2023)	The Impact of Agricultural Credit on Banana Cultivation in Valle del Cauca, Colombia.	Quantitative	Colombia	2023	Scielo
23	Chávez, W., Morante, M.. Cueva, E., Cruz, O., & Chávez, O. (2022)	Factors influencing the income of farming families in Amazonas, Peru.	Qualitative	Peru	2022	Scielo
24	Amaya, G. (2023)	Agriculture and agribusiness in the Osa Peninsula: historical construction of a territorial project.	Quantitative	Costa Rica	2023	Scielo
25	González, J., & López, R. (2024)	Credit for small corn producers in the lake	Mixed	Mexico	2024	Scielo

		regions of Michoacán.				
26	Huacchillo, L., Ramos, E., & Pulache, J. (2020)	Financial management and its impact on financial decision-making.	Quantitative	Peru	2020	Scielo
27	Loor-Rodríguez, B., Veliz-Chávez, D., Carranza-Loor, C., & Márquez-Bravo, Y. (2024)	Financial education for the economic development of the woodworking sector, Chone, Ecuador.	Quantitative	Ecuador	2024	Scielo
28	Cervantes-Mendoza, Lita Karina. (2024)	Training and financial management for micro and small enterprises.	Quantitative	Peru	2024	Scielo
29	Urdaneta, A., Fernández, M., Mejía, O & Borgucci, E. (2024)	Causal relationships between bank credit to the private sector, total deposits, and gross domestic product in Ecuador.	Quantitative	Ecuador	2024	Scielo
30	Colachagua, S. E., Yarin, C. E., & Castillo, M. N. (2023)	Impact of microcredit on economic growth in the Junín region, 2013–2017.	Quantitative	Peru	2023	Scielo

Table 1. Characteristics of the articles analyzed.

RESULTS AND DISCUSSION

Based on the literature review, the following topics are addressed: Agricultural clusters, access to credit, financial development.

Author	**Objective**	**Contribution to agricultural cluster**	**Contribution to access to agricultural credit**	**Contribution to financial development**
Gidelew, G. E., Alemu, B. A., & Kassie, K. E. (2024)	Analyze the impact of cluster agriculture on food security in rural households in northwestern Ethiopia.	Improves food security in terms of quantity, acceptability, and stability.	It implies improvements in income that could facilitate access to financing.	Efficient use of income is key to food security and financial development.
Otsuka, K., & Ali, M. (2020)	Formulate strategies to transform agriculture-based clusters into agro-industrial clusters.	Linking producers and processors improves the production of high-value agricultural	Strengthening structures and cooperation facilitates conditions for financing.	Capacity building and cooperatives improve access to financial resources.

		products.		
Zeleke, A. Z., &Wordofa, M. G. (2024)	Summarize the benefits of cluster agriculture on the household economy of smallholder farmers in Ethiopia.	Increased income, improved livelihoods, and poverty reduction.	Access to credit services influences participation in clusters.	Marketing improves income and facilitates wealth accumulation.
Nawaz, M., & Avetisyan, M. (2025)	Analyze imperfections in the rural credit market and their impact on climate change adaptation in Pakistan.	Financing inequalities limit sustainable clusters.	Inefficiencies in credit markets require reforms to facilitate financing.	Improve financing policies and financial inclusion.
Ertunç, E., &Karkinlı, A. E. (2021)	Develop a cluster-based approach for land valuation in land consolidation.	More accurate valuation in land consolidation projects.	More reliable assessments can facilitate financing.	Improved land valuation facilitates access to agricultural credit.
Joffre, O. M., De, J. R., Klerkx, L., & Poortvliet, P. M. (2020)	Investigate the role of clusters in access to knowledge and technology adoption in aquaculture in Vietnam.	Facilitates the adoption of sustainable practices through trust and networks.	A relationship of trust can improve bargaining position and access to financing.	Collaboration in clusters helps manage risks and improve financial performance.
Nakano, Y., & Magezi, E. F. (2020)	Examine the impact of microcredit on technology adoption and rice productivity in Tanzania.	Access to microcredit influences innovation within clusters.	Improving access to credit does not always lead to changes in technology adoption.	Microcredit is not sufficient as a financial development tool.
Caruso et al. (2020)	Propose a new methodology for assessing credit risk through mixed data clustering.	Does not mention a specific agricultural cluster, but highlights the importance of credit in various industries.	Proposes a credit risk classification to improve access.	Contributes to financial system stability and economic development.

Wang et al. (2023)	Build a model to profile farmers according to their performance.	Analyzes farmer characteristics to optimize production and promote agricultural clusters.	Does not directly address the issue, but findings may influence agricultural financing.	Improves the efficiency and economic viability of the sector.
Li et al. (2024)	Analyze the relationship between credit scores, willingness to pay, and credit default.	Improves understanding of credit compliance in the agricultural sector.	Highlights the importance of ratings in facilitating access.	Contributes to rural financial inclusion.
Shano & Waje (2024)	Assess the impact of microcredit on agricultural technology adoption in Ethiopia.	Explains how microcredit strengthens agricultural clusters.	Highlights its importance for agricultural technology adoption.	Improves access to financial services and sustainability.
Lu et al. (2024)	Explore the relationship between financial literacy and credit default.	Links financial literacy to the stability of the agricultural cluster.	Proposes that greater literacy improves access.	Reduces defaults and strengthens financial stability.
Kimaro et al. (2024)	Analyze the relationship between cooperative irrigation agriculture and food security.	Highlights the importance of cooperative agriculture in Africa.	Highlights the need to improve access to credit.	Identifies institutional and financial support as key to success.
Witinok-Huber & Radil (2021)	Explore the impact of gender and geography on access to agricultural resources.	Presents a framework for monitoring and improving access to agricultural services.	Highlights gender disparities in access to credit.	Promotes equitable access to resources and financing.
Sánchez, A., & Sánchez, R., (2021)	Analyze the emergence, development, and economic impact of the avocado cluster in Michoacán, Mexico.	Business integration and business models strengthen competitiveness.	Access to credit has been key to sustaining growth.	Foreign investment and capital have boosted the sector.
Tongo, E., & Soplín, H. (2022)	Assess the sustainability of	Identifies and groups	Indirect relationship with	Assesses the economic

	livestock production systems in Oxapampa, Peru.	production systems.	institutional dependence.	sustainability of systems.
Paccioretti, P., Córdoba, M., & Balzarini, M. (2020)	Analyze wheat yield variability and compare precision agriculture zoning software.	Enables efficient classification and management of productive areas.	Highlights the lack of access to agricultural credit.	The use of digital tools can improve agricultural profitability.
Aquino, V.,, Camarena, F., Julca, A., & Jiménez, J.. (2018)	Characterize tarwi production units in the Mantaro Valley, Peru.	Identifies and classifies producer groups.	Not mentioned directly, but facilitates understanding of financing needs.	Characterization enables financial development strategies.
Ayaviri-Nina, D., Romero-Flores, M., Fuentes-Gavilanez, L., Chiriboga-Zamora, P., & Sánchez-Cuesta, P.. (2022)	Determine the capacity of microcredit to finance agricultural activity in Chimborazo and its impact on territorial development.	Strengthens productive activity in agricultural clusters.	Improves access to financing for small producers.	Boosts financial development in rural areas.
Rojas, L., Rojas, R., & Baylon, E. (2024)	Analyze the influence of agricultural production factors on economic growth in the Pasco Region (2012-2022).	Improve collaboration in the agricultural sector.	Destaca la falta de acceso al crédito agrario.	Importancia de infraestructura y tecnología para financiamiento.
Ferrer, R., Florida, N., Vargas, F., Ancobar, D., Alvarado, Y., & Maldonado, A. (2023)	Determine the influence of financing on cocoa production and marketing in Leoncio Prado (2020/2021).	Impact of financing on the competitiveness of the cocoa sector.	Solo el 37% de los agricultores acceden a crédito, con tasas altas.	Se necesitan mejores condiciones de financiamiento para el sector agrícola.
Rivera-Acosta, Javier, & Xiuchuan, Xu. (2023)	Explore the effect of agricultural credit on banana crop yields in the Cauca Valley.	Strategies to increase farmer participation in credit programs.	Factores que incrementan el acceso al crédito (maquinaria, educación, etc.).	Mejora en acceso al crédito puede aumentar la productividad agrícola.
Chávez, W., Morante, M.. Cueva, E., Cruz, O., & Chávez, O.	Determine the factors that influence the income of farming	Factores como tecnología y cambio climático impactan los	Destaca la falta de acceso al crédito agrario.	Identifica factores que pueden apoyar políticas

(2022)	families in Amazonas, Peru.	ingresos agrarios.		financieras y económicas.
Amaya, G. (2023)	Analyze the configuration of the socio-productive process in the Osa Peninsula, Costa Rica.	Emergencia de la cooperativa OSACOOP como alternativa de organización.	OSACOOP facilita acceso a financiamiento y capacitación.	Generación de ingresos sostenibles para campesinos a través de la cooperativa.
González, J., & López, R. (2024)	Analyze access to public credit for small corn producers in Michoacán (1981-2022)	Destaca la importancia del financiamiento rural	Identifica la exclusión desde los 90 y la necesidad de políticas inclusivas	Esencial para el desarrollo económico regional
Huacchillo, L., Ramos, E., & Pulache, J. (2020)	Design a business intelligence system to improve financial management at the Mariel Shipyard	Beneficio a las PYMES agrarias	Destaca la falta de conocimiento sobre financiamiento	Promueve herramientas de gestión financiera
Loor-Rodríguez, B., Veliz-Chávez, D., Carranza-Loor, C., & Márquez-Bravo, Y. (2024)	Analyze financial education for the woodworking sector in Chone	La baja educación financiera limita la participación en el mercado	28% de los encuestados desconocía el acceso a créditos sin garantías	Mejora la rentabilidad y sostenibilidad de los negocios
Cervantes-Mendoza, Lita Karina. (2024)	Analyze training and financial management of micro and small enterprises	La capacitación mejora la gestión financiera en el clúster agrario	Un buen conocimiento financiero facilita el acceso a financiamiento	Mejora las prácticas empresariales y sostenibilidad
Urdaneta, A., Fernández, M., Mejía, O & Borgucci, E. (2024)	Relationship between bank credit, deposits, and GDP in Ecuador	El acceso al crédito privado podría beneficiar al sector agrario	Destaca la necesidad de créditos accesibles y tasas de interés más bajas	El bajo acceso al crédito limita el crecimiento económico
Colachagua, S. E., Yarin, C. E., & Castillo, M. N. (2023)	Impact of microcredit on economic growth in Junín (2013-2017)	El microcrédito impulsa emprendimientos rurales	Democratiza el sistema financiero y facilita la inclusión	Mejora la calidad de vida y fomenta el crecimiento económico

Table 2. Contributions of the articles analyzed

Improved access to agricultural credit

Access to agricultural credit is a critical factor in the economic growth and sustainability of small producers in emerging markets. In this context, agricultural clusters have proven to be an effective strategy for consolidating productive networks that optimize financing

conditions, especially in environments where financial markets have structural limitations (Otsuka and Ali, 2020). Consequently, the coordination between producers, processors, and marketers has been demonstrated to generate economies of scale and to encourage the participation of credit institutions, thereby promoting financial stability and productive expansion (Nawaz and Avetisyan, 2025).

Nevertheless, deficiencies in rural credit markets pose a substantial challenge for small farmers, necessitating reforms that aim to reduce collateral requirements and enhance the flexibility of financing structures. Consequently, expanding credit coverage for producers traditionally excluded from the financial system has been identified as a priority (Nawaz and Avetisyan, 2025). Despite its recognition as a promising instrument for enhancing financial inclusion, empirical evidence has produced equivocal results regarding its impact on increasing productivity and the adoption of agricultural technologies (Nakano and Magezi, 2020). In this regard, recent studies underscore the transformative potential of digital credit ratings in the realm of agricultural financing. These ratings facilitate real-time risk assessment, and the development of financing strategies tailored to the unique characteristics of individual producers (Li et al., 2024).

From a technical vantage point, the implementation of sophisticated methodologies for credit risk assessment emerges as a pivotal strategy for optimizing access to finance. Specifically, models based on cluster analysis have enabled more accurate classification of applicants, reduced default risks and optimizing the allocation of financial resources in the agricultural sector (Caruso et al., 2020). Consequently, the implementation of these models has been shown to reduce credit rejection rates and to facilitate access to formal financing under more favorable conditions for producers with limited credit history (Li et al., 2024).

In the domain of public policy, the transformation of financial structures directed towards the agricultural sector must consider inclusive models that overcome the systematic exclusion of small producers, a persistent problem since the 1990s (González and Paniagua, 2024). Perceived repayment capacity remains a limiting factor in the granting of credit, emphasizing the need to develop credit rating systems that incorporate productive variables and not exclusively traditional financial criteria (Li et al., 2024). In this regard, the dearth of adequate financial instruments has engendered structural impediments that restrict access to agricultural inputs and technologies, impeding the efficiency and competitiveness of smaller farms (González and Paniagua, 2024).

To address these limitations, strategies aimed at improving access to finance should focus on reducing both institutional constraints and information barriers faced by small producers. In this context, the digitization of financial services emerges as a viable solution because it helps reduce information asymmetries and facilitates the inclusion of farmers in formal credit circuits (Rojas et al., 2024). Conversely, the enhancement of cooperative frameworks has been demonstrated to be an efficacious approach for fostering trust between financial intermediaries and producers, facilitating credit approval, and ensuring the stability of the agricultural financial system (Otsuka and Ali, 2020).

Consequently, approaches grounded in producer groupings have demonstrated efficacy in formulating more adaptable financing schemes that exhibit reduced reliance on conventional collateral requirements prevalent in banking institutions and enhanced alignment with the requisites of the agricultural sector (Nawaz and Avetisyan, 2025). These schemes have been shown to encourage the adoption of agricultural technologies by providing liquidity at key moments in the production cycle. Additionally, they have been demonstrated to have a positive impact on farmers' profitability and food security in rural communities (Nakano and Magezi, 2020).

This analysis demonstrates that enhancing access to agricultural credit necessitates a comprehensive approach that incorporates structural reforms and financing strategies tailored to the specific characteristics of the sector. The implementation of advanced credit assessment methodologies, the digitization of financial services, and the consolidation of cooperative structures have been identified as viable solutions to ensure the financial inclusion of small producers and to stimulate economic development in rural areas (Otsuka and Ali, 2020; Nawaz and Avetisyan, 2025; Nakano and Magezi, 2020; Caruso et al., 2020; Li et al., 2024; González and Paniagua, 2024; Rojas et al., 2024).

Financial development in rural áreas

The financial development of rural areas is contingent upon the integration of small producers into organized structures. Such integration not only facilitates access to finance but also promotes economic stability (Gidelew et al., 2024). In this regard, the consolidation of agricultural clusters has been demonstrated to be an effective mechanism for enhancing farmers' capacity to obtain credit and efficiently manage their financial resources (Joffre et al., 2020). However, despite these advances, access to credit remains a significant challenge in many regions due to the lack of collateral and the absence of financial models adapted to the dynamics of the agricultural sector (Ertunç and Karkinlı, 2021).

In this context, the limited availability of capital in rural areas has been identified as a constraining factor for the expansion of agricultural financing, which in turn negatively impacts the productivity and sustainability of the sector (Urdaneta et al., 2024). Moreover, the dearth of knowledge concerning resource management and financial planning has contributed to elevated levels of indebtedness among farmers, thereby exacerbating the problem of access to credit (Lu et al., 2024). In this regard, banking institutions, by requiring traditional guarantees that many producers cannot provide, restrict access to formal financing and perpetuate a cycle of financial exclusion (Ertunç and Karkinlı, 2021).

It is imperative to underscore that the consolidation of collaborative networks within agricultural clusters has engendered more conducive conditions for securing financing, thereby enabling agricultural producers to more readily access credit (Joffre et al., 2020). To address this issue, the implementation of advanced land valuation methodologies has improved credit risk assessment and facilitated loan approval for the agricultural sector (Ertunç and Karkinlı, 2021). Consequently, the trust established between producers and lenders has led to a reduction in the perception of risk, resulting in more competitive interest rates and greater availability of credit (Joffre et al., 2020). This structure has been instrumental in enhancing the financial stability of small producers, enabling them to diversify their revenue sources and mitigate economic vulnerability (Ferrer et al., 2023).

Conversely, financial literacy has been identified as a pivotal factor in the financial development of rural areas. A dearth of economic management skills can impede farmers' capacity to secure financing on favorable terms (Lu et al., 2024). In response to this situation, restricted access to traditional financial services has encouraged the adoption of technological solutions that seek to improve the financial inclusion of rural producers (Rojas et al., 2024). In this regard, the implementation of financial education programs has shown positive results in optimizing farmers' economic management, allowing more efficient access to credit on more favorable terms (Lu et al., 2024). Furthermore, the integration of digital banking processes and the implementation of credit assessment platforms have contributed to the facilitation of farmers' participation in formal financing

schemes, leading to a reduction in administrative costs and an enhancement in resource management efficiency (Huacchillo et al., 2020).

At the macroeconomic level, the availability of bank credit in rural areas has demonstrated a positive correlation with gross domestic product growth (Urdaneta et al., 2024). Indeed, the expansion of financial services in the agricultural sector has been demonstrated to boost the economic development of rural communities by encouraging greater investment in infrastructure and technology (Urdaneta et al., 2024). However, to maximize these benefits, credit policies must be tailored to the specific characteristics of the sector, allowing for a more equitable distribution of financial resources and ensuring that small producers are not excluded (Gidelew et al., 2024).

In summary, financial development in rural areas is contingent not solely on the availability of credit, but also on the implementation of comprehensive strategies that promote the economic stability of small producers (Ferrer et al., 2023). The integration of technological tools, financial education, and the consolidation of cooperative networks has been identified as a pivotal factor in enhancing financial inclusion within the agricultural sector (Joffre et al., 2020). Consequently, ensuring equitable and efficient access to finance is imperative to strengthen the sustainability of the financial system in rural communities and boost the economic development of the agricultural sector (Gidelew et al., 2024).

Impact of clusters on agricultural productivity

The impact of clusters on agricultural productivity is evident in increased producer incomes and reduced poverty in rural areas (Zeleke and Wordofa, 2024). In this context, the cluster organization has enhanced production efficiency through collaboration among farmers, optimized access to inputs, and strengthened marketing networks (Shano and Waje, 2024). This structure has also engendered conditions conducive to the adoption of new agricultural technologies, thereby enhancing the sector's competitiveness (Witinok-Huber & Radil, 2021).

In particular, access to finance within clusters has facilitated the implementation of technological innovations that optimize agricultural production (Colachagua et al., 2023). In regions where producers have integrated into agricultural clusters, there has been greater investment in equipment and agricultural management practices that increase crop profitability and sustainability (Rivera-Acosta & Xu, 2023). Collective organization has also been demonstrated to reduce production costs and mitigate economic risks by facilitating the sharing of resources and technical information among cluster members (Chávez et al., 2022).

In this regard, the sustainability of production systems within clusters is closely associated with farmers' capacity to obtain financing on favorable terms (Tongo and Soplín, 2022). The consolidation of cooperative structures has facilitated negotiations with financial institutions, thereby reducing dependence on intermediaries that traditionally increase production costs (Zeleke and Wordofa, 2024). Furthermore, this organization has played a pivotal role in promoting food security by enhancing the accessibility of agricultural products in local markets and augmenting farmers' incomes (Shano and Waje, 2024).

From a financial perspective, the relationship between agricultural productivity and access to finance has been the subject of extensive research. Research indicates that producers who organize in clusters are more likely to obtain credit than those who work independently (Witinok-Huber & Radil, 2021). The financial stability derived from this structure has enabled greater adoption of technology and improved efficiency in the use of productive resources (Colachagua et al., 2023). Consequently, this integration model has

been demonstrated to be an effective strategy for reducing farmers' economic vulnerability to market fluctuations and adverse weather events (Rivera-Acosta & Xu, 2023).
Concurrently, the enhancement of commercial relationships within these clusters has yielded substantial benefits, thereby augmenting the competitiveness of the agricultural sector (Chávez et al., 2022). The implementation of joint marketing strategies has enabled producers to obtain more favorable prices for their products and gain access to broader markets (Tongo and Soplín, 2022). Concurrently, collaboration among cluster members has facilitated the dissemination of knowledge and the adoption of more efficient agricultural practices, which has contributed to improving both the quality and quantity of agricultural production (Zeleke and Wordofa, 2024).
The integration of farmers into clusters has also promoted crop diversification and the development of value chains that increase the profitability of agricultural production (Shano and Waje, 2024). This organizational model has enabled producers to access government incentives and financial support programs aimed at modernizing the agricultural sector (Witinok-Huber & Radil, 2021). In this context, the combination of adequate financing, access to technology, and strengthened marketing networks has become a determining factor for the sustainable growth of small producers within agricultural clusters (Colachagua et al., 2023).
It is imperative to underscore that the impact of clusters on agricultural productivity is contingent on the interaction between financing, technology, and cooperation among producers (Rivera-Acosta & Xu, 2023). The consolidation of these structures has been identified as a pivotal factor in the economic development of the rural sector, facilitating the integration of small farmers into national and international markets (Chávez et al., 2022). Consequently, the promotion of these organizational models is an effective strategy to ensure sustainable growth and financial stability in the agricultural sector (Tongo and Soplín, 2022).

Microloans and financing for small producers

Access to microcredit has been identified as a critical strategy for enhancing the financial inclusion of small producers and fortifying their productive capacity within the agricultural sector (Nakano and Magezi, 2020). However, the mere availability of credit does not guarantee an increase in productivity or technology adoption. Various factors, such as financial education and income stability, influence producers' ability to effectively leverage financing (Ayaviri-Nina et al., 2022). In this context, microcredit has the potential to be a transformative instrument; however, its effectiveness is contingent upon the implementation of complementary strategies that optimize its impact.
In many rural regions, access to microcredit has enabled smallholder farmers to purchase inputs, seeds, and technology that were previously beyond their financial reach (Cervantes-Mendoza, 2024). However, the conditions under which these loans are granted represent a significant obstacle, as high interest rates and short repayment terms limit their financial sustainability (Colachagua et al., 2023). Furthermore, the financial system in rural areas predominantly caters to producers who possess assets or collateral, thereby excluding those who do not meet the credit requirements of financial institutions (González and Paniagua, 2024).
From an analytical perspective, the impact of microcredit on agricultural activity has been the subject of several studies, which have found that, although microcredit can improve producers' liquidity, its impact on the modernization of production remains limited (Aquino et al., 2018). This limitation is largely attributable to the absence of technical

support and financial training programs, which impedes the effective utilization of resources acquired through credit (Mejía et al., 2024). In many cases, farmers utilize financing to meet fundamental needs rather than allocating it toward the enhancement of their production, thereby constraining the transformative capacity of this instrument (Ayaviri-Nina et al., 2022).

In order to enhance the efficacy of microcredit in the realm of agricultural financing, it is essential to devise programs that integrate access to credit with training strategies in financial management and production planning (Nakano and Magezi, 2020). In this regard, financial institutions have begun to implement credit models tailored to the specific needs of the agricultural sector, including financing schemes with grace periods adjusted to harvest cycles and flexible payment models (Cervantes-Mendoza, 2024). These initiatives have been demonstrated to be more effective in enhancing the profitability of small producers and reducing the default rate in the agricultural sector (Colachagua et al., 2023).

Concurrently, the enhancement of cooperative frameworks has been identified as a pivotal approach for facilitating enhanced access to financial resources for small producers (González and Paniagua, 2024). The formation of cooperatives has enabled farmers to secure more advantageous credit terms and mitigate the risk perceived by financial institutions, thereby functioning as intermediaries between producers and lenders (Aquino et al., 2018). These organizational models have enabled small farmers to access financing without the need for individual guarantees, which has facilitated the expansion of agricultural production in various regions (Mejía et al., 2024).

Nevertheless, substantial challenges persist with regard to financial sustainability and the equitable distribution of financing (Ayaviri-Nina et al., 2022). In numerous instances, the producers who most require access to credit are precisely those who encounter the most significant barriers to obtaining it due to restrictions imposed by conventional credit institutions (Nakano and Magezi, 2020). It is therefore essential to develop public policies aimed at promoting inclusive agricultural financing and facilitating the integration of small producers into more competitive markets (Cervantes-Mendoza, 2024).

The efficacy of microcredit as a catalyst for agricultural development is contingent upon the capacity of financial systems to adapt to the unique requirements of the rural sector (Colachagua et al., 2023). The combination of accessible credit, financial education, and collective support structures has proven to be an effective strategy for boosting the productivity and stability of small producers (González and Paniagua, 2024). In this regard, the consolidation of more equitable and sustainable financial models in the agricultural sector will be a determining factor in ensuring the development and economic security of rural producers (Aquino et al., 2018).

Technological innovation and financial adoption

The integration of technologies in the agricultural sector has transformed the way small producers access financing and optimize their economic management. Consequently, the integration of digital instruments for credit risk assessment has effectively mitigated barriers to credit access, thereby promoting the financial inclusion of farmers with limited credit histories (Ertunç and Karkinlı, 2021). Consequently, these innovations have enhanced resource allocation in the agricultural sector, enabling producers with limited investment capacity to obtain financing on more equitable terms (Paccioretti et al., 2020).

Consequently, the employment of specialized software has emerged as a pivotal factor in enhancing the precision of financial decision-making within the sector. The implementation of digital platforms that analyze production and yield data has enabled

farmers to demonstrate their financial viability to banking institutions, thereby increasing their likelihood of obtaining credit (Li et al., 2024). This shift has led to a decline in reliance on conventional credit assessment systems, which frequently exclude small producers due to their inability to provide formal guarantees (Loor-Rodríguez et al., 2024).
Conversely, the development of predictive models based on artificial intelligence has generated new opportunities for credit risk assessment in the agricultural sector. The employment of machine learning algorithms has enhanced the precision of financial analysis and mitigated uncertainty in the approval of agricultural loans (Wang et al., 2023). Consequently, these advancements have been instrumental in enhancing the stability of the financial system in rural regions and facilitating access to finance for producers in areas with limited banking penetration (Caruso et al., 2020).
Concurrently, the integration of technology within the agricultural sector has enabled enhanced access to credit resources and streamlined resource management and financial planning for producers (Paccioretti et al., 2020). The advent of digital technologies in the domains of accounting and administration has empowered farmers to exercise greater control over their expenditures and to project their long-term profitability with greater precision (Li et al., 2024). This strategy has proven instrumental in enhancing the economic resilience of small producers and fostering investment in technological innovation within the sector (Cervantes-Mendoza, 2024).
Moreover, the enhancement of financial education has emerged as a pivotal element in facilitating the adoption of novel technologies in the realm of agricultural finance management. Training in digital tools and financial planning models has enabled rural producers to take advantage of the financing opportunities available in the market more efficiently (Wang et al., 2023). Consequently, this integration of technology and training has enhanced farmers' financial stability and facilitated their integration into more competitive markets (Ertunç and Karkinlı, 2021).
It is noteworthy that advancements in digitization have exerted a favorable influence on the optimization of agricultural credit and the mitigation of delinquency within the sector (Caruso et al., 2020). Specifically, the automation of credit assessment processes has enabled the identification of patterns of default and the adjustment of financing conditions to enhance producers' capacity to meet their financial obligations (Li et al., 2024). These strategies have been shown to reduce financial risk for lenders and to expand financing opportunities for farmers who previously did not meet traditional credit access requirements (Paccioretti et al., 2020).
Consequently, the integration of technology into financial management has been demonstrated to be a highly effective instrument in mitigating financial exclusion and enhancing the economic stability of small agricultural producers (Wang et al., 2023). The integration of sophisticated digital instruments, specialized financial management instruction, and pioneering credit assessment methodologies has profoundly altered the landscape of financial access within the agricultural sector (Loor-Rodríguez et al., 2024). It is evident that, in the long term, these advances will continue to play a pivotal role in the modernization of agricultural finance and the enhancement of productivity in the rural sector (Ertunç y Karkinlı, 2021).

Cooperative movement and sustainable financing

As Otsuka and Ali (2020) demonstrate, agricultural cooperatives have played a crucial role in improving access to finance and strengthening economic development in rural areas. In this context, the collective organization of producers has enabled the negotiation of more

favorable credit terms, thereby facilitating access to finance without the necessity of high individual guarantees (Joffre et al., 2020). Consequently, this model has mitigated farmers' economic vulnerability by promoting equitable distribution of resources and shared financial risk management (Kimaro et al., 2024).

Historically, access to credit in agricultural communities has been restricted due to the lack of financial structures adapted to the specific characteristics of the rural sector (Amaya, 2023). In this regard, the formation of producer associations has facilitated access to financing by consolidating credit demand in a single entity. This mechanism has been shown to contribute to a reduction in transaction costs for banking institutions and an enhancement in farmers' bargaining power (Wang et al., 2023). Consequently, the optimization of investment in infrastructure and technology has boosted agricultural productivity and consolidated the sector's economic stability (Rojas et al., 2024).

In addition to facilitating access to credit, cooperatives have promoted the adoption of sustainable financing models in the agricultural sector (Otsuka and Ali, 2020). In particular, collective resource management has resulted in the establishment of savings funds and revolving credit schemes that guarantee constant availability of capital for farmers. This strategy has led to a reduction in the reliance on external financial institutions, thereby enhancing the autonomy and resilience of producers in the face of market fluctuations (Joffre et al., 2020). Consequently, a more inclusive financing system that is better adapted to the challenges of the rural environment has been consolidated (Kimaro et al., 2024).

A multitude of studies have demonstrated the positive impact of cooperatives on farmers' financial stability. Specifically, it has been demonstrated that producers organized in cooperatives exhibit lower default rates and higher levels of profitability compared to those who operate individually (Amaya, 2023). In this context, the generation of economies of scale has enabled farmers to reduce production costs and improve their access to national and international markets (Wang et al., 2023). Integration into cooperation networks has been shown to facilitate income diversification and reduce the economic vulnerability of small producers, generating a positive impact on rural financial development (Rojas et al., 2024).

However, despite the progress made, equitable access to finance in the agricultural sector remains a challenge, especially in communities where traditional credit systems do not respond to the specific needs of small producers (Otsuka and Ali, 2020). In this regard, the establishment of financing mechanisms founded on collaboration among producers has facilitated the overcoming of these barriers by promoting financial inclusion and fortifying the long-term sustainability of the agricultural sector (Joffre et al., 2020). Indeed, this model has been implemented in various regions, yielding positive outcomes in terms of enhanced access to credit and economic stability for producers (Kimaro et al., 2024).

In summary, cooperativism has been demonstrated to be an effective strategy for ensuring access to sustainable financing in the agricultural sector. The combination of collective savings, revolving financing, and shared risk management has strengthened the economic resilience of rural communities and reduced financial exclusion in the sector (Amaya, 2023). Consequently, the promotion and consolidation of these organizational models is imperative for the development of a more inclusive and sustainable rural financial system (Wang et al., 2023; Rojas et al., 2024).

CONCLUSIONS

The agricultural sector has witnessed a paradigm shift in its access to finance, characterized by the integration of cooperative models, the digitalization of financial services, and the implementation of sophisticated credit assessment methodologies. Participation in clusters has been demonstrated to be an effective mechanism for improving the economic stability of producers by strengthening their bargaining power and facilitating their access to credit. Nevertheless, financial exclusion persists as a significant impediment for numerous farmers, particularly those lacking traditional collateral or a formal credit history. The implementation of technological tools and financing models adapted to the reality of the sector has made it possible to reduce these limitations, optimize resource allocation, and promote financial inclusion in rural communities.

The impact of agricultural financing extends beyond the mere availability of credit; it is contingent upon a multifaceted strategy that fosters economic stability and productive sustainability. Financial literacy has been demonstrated to be a significant factor in farmers' capacity to manage their resources and attain more favorable financing terms. Consequently, the integration of digital platforms has led to the enhancement of credit risk assessment, thereby facilitating loan access for producers lacking a documented financial history. The integration of small farmers into cooperative models has facilitated the generation of economies of scale, cost reduction, and market expansion, thereby strengthening the long-term stability of the agricultural sector.

Achieving financial development in the agricultural sector necessitates a multifaceted approach that integrates the digitalization of services, financial education, and the consolidation of producer networks. The evolution of financing models has demonstrated that the integration of technology, accessibility to flexible credit, and collective organization enhances the profitability of small producers and fortifies their capacity to adapt to market dynamics. The enhancement of cooperative frameworks, the integration of more inclusive financing models, and the digital transformation of financial services have been identified as pivotal strategies to ensure the sustainability of the agricultural sector and its integration into progressively competitive markets.

One of the primary obstacles impeding access to agricultural finance is the pervasive presence of structural impediments that impede the integration of small producers within formal financial markets. Despite the advent of digitization and innovative credit assessment methodologies, the dearth of banking infrastructure in rural areas continues to circumscribe the efficacy of these mechanisms. Furthermore, the reluctance of some farmers to utilize digital technologies, often attributable to a paucity of training or restricted access to technological devices, serves as an impediment to the adoption of more efficient financial solutions. The heterogeneity of production systems also signifies that certain financing models may not be universally applicable, necessitating a more adaptable design that aligns with the socioeconomic characteristics of each agricultural community.

Future research could concentrate on evaluating the long-term ramifications of agricultural clusters and financing strategies on the economic sustainability of rural producers. A comparative analysis of the effectiveness of digital financing models and traditional schemes would provide insight into the optimal conditions for maximizing financial inclusion. The integration of emerging technologies, such as blockchain and smart contracts, into agricultural credit management has the potential to provide more secure and effective financial risk management strategies. A comprehensive investigation into the role of financial education in the stability of producers is imperative. Furthermore, it is crucial

to explore the potential of training in digital tools to enhance producers' access to finance and improve their competitiveness in global markets.

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