Hungarian Association of Agricultural Informatics
European Federation for Information Technology in Agriculture, Food and the Environment

Journal of Agricultural Informatics. Vol. 16, No. 1
journal.magisz.org

The Role of Development Financial Institutions in Agricultural Sustainable Development: A Systematic Literature Review

Asep Yusup Mamun[1], László Várallyai[2]

I N F O
Received 13/04/2025
Accepted 03/06/2025
Available on-line 11/06/2025
Responsible Editor: Róbert Szilágyi

Keywords:
Systematic Literature Review, Development Financial Institutions, Sustainable Agriculture, Rural Development, Agricultural Finance, Technological Innovation, Climate Resilience.

JEL Classification Codes:
O13, Q14, Q18, G21, R51

A B S T R A C T
This systematic literature review explores the role of Development Financial Institutions (DFIs) in advancing sustainable agricultural development and rural economic growth. Based on an analysis of 73 articles from the Scopus database, the study highlights DFIs' key contributions, including the provision of financial support, promotion of technological modernisation, and development of rural infrastructure. It also examines the strategies DFIs employ to foster innovation, enhance productivity, and support climate-resilient agricultural practices. Despite their significant roles, DFIs encounter various challenges, such as limited institutional capacity, inadequate financial resources, and high risks associated with agricultural lending. The review suggests strengthening institutional frameworks, fostering collaboration among governments, DFIs, and the private sector, and designing financial products tailored to the specific needs of the agricultural sector. These findings offer valuable insights for policymakers, researchers, and financial institutions seeking to enhance the effectiveness of DFIs in promoting sustainable agriculture and rural development.

1. Introduction

Agricultural development is essential for economic growth, food security, and sustainability, particularly in developing regions. Development Financial Institutions (DFIs) play a critical role by providing financial access, infrastructure, and risk mitigation to support sustainable agriculture (Soundarya & Jayabal, 2020; Khan et al., 2024). DFIs have improved access to rural credit, notably in countries like India and Russia, while also promoting green financing initiatives in Indonesia (Budiasa, 2020) and implementing sustainability-focused financial instruments in the European Union (Cisilino & Licciardo, 2022). However, persistent challenges remain, including limited financial access in rural areas, stringent loan conditions, weak institutional capacity (Raifu & Aminu, 2020), and inadequate evaluation mechanisms (Yaron, 2006). Overcoming these barriers requires innovative financial solutions, stronger institutional frameworks, and enhanced public-private partnerships (Nkala, 2023). This systematic review examines the role of DFIs in advancing agricultural sustainability, promoting financial inclusion, and managing risk. The structure of the study is as follows: Section 1 introduces the topic, Section 2 outlines the methodology, Section 3 presents the results, Section 4 explores implementation challenges and opportunities, and Section 5 concludes with key insights and policy recommendations.

2. Methodology

This study employed a systematic literature review, following the approach outlined by Felizardo et al. (2017), to identify and synthesise knowledge on the role of Development Financial Institutions (DFIs) in agricultural development. The review followed a structured protocol, beginning with the formulation of research questions, followed by the selection of relevant articles, data extraction, methodological

[1] Asep Yusup Mamun
University of Debrecen
e-mail: *asep.mamun@econ.unideb.hu*
[2] Várallyai László
University of Debrecen
e-mail: *varallyai.laszlo@econ.unideb.hu*

assessment, synthesis of findings, and final analysis. Clear inclusion and exclusion criteria were established to ensure replicability and reliability (Serafini, 2022). Systematic reviews offer a rigorous, unbiased approach to evaluating and consolidating scientific knowledge (Roever, 2017; Galvao & Ricarte, 2020). The Scopus database was chosen for its comprehensive coverage, rigorous indexing, and high accuracy in author identification (Powell & Peterson, 2017; Pranckutė, 2021). Scopus also provides robust citation metrics and impact indicators, making it highly suitable for systematic review studies (Falagas et al., 2008). This study adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, ensuring methodological rigor through defined stages of identification, screening, eligibility, and inclusion (Moher et al., 2016). This approach allowed for mapping global experiences concerning DFIs' roles in agricultural finance, technological innovation, risk management, and policy support.

2.1. Research Question

A structured framework guided the study selection and analysis to ensure a comprehensive review. The PICO strategy—Population, Intervention, Comparison, Outcome—was used to frame the research questions, as suggested by Santos et al. (2007) and García-Feijoo et al. (2020). Based on this model, the research focused on: (1) how DFIs contribute to financing sustainable agricultural development and rural economies; (2) what strategies DFIs implement to support technological advancement and modernisation in agriculture; and (3) what challenges DFIs face in agricultural finance and how their effectiveness can be improved.

2.2. Research Strategies

A review of prior literature and a pilot test informed the development of keywords for the search process. The search string combined terms such as "development financ* institution*" or "development bank*" with "agricultur*," targeting titles, abstracts, and keywords. This search retrieved 371 documents. Using the PRISMA protocol (Page et al., 2021), truncation symbols and Boolean operators were applied as follows:
(("development financ* institution*" OR "development bank*") AND ("agricultur*")) .

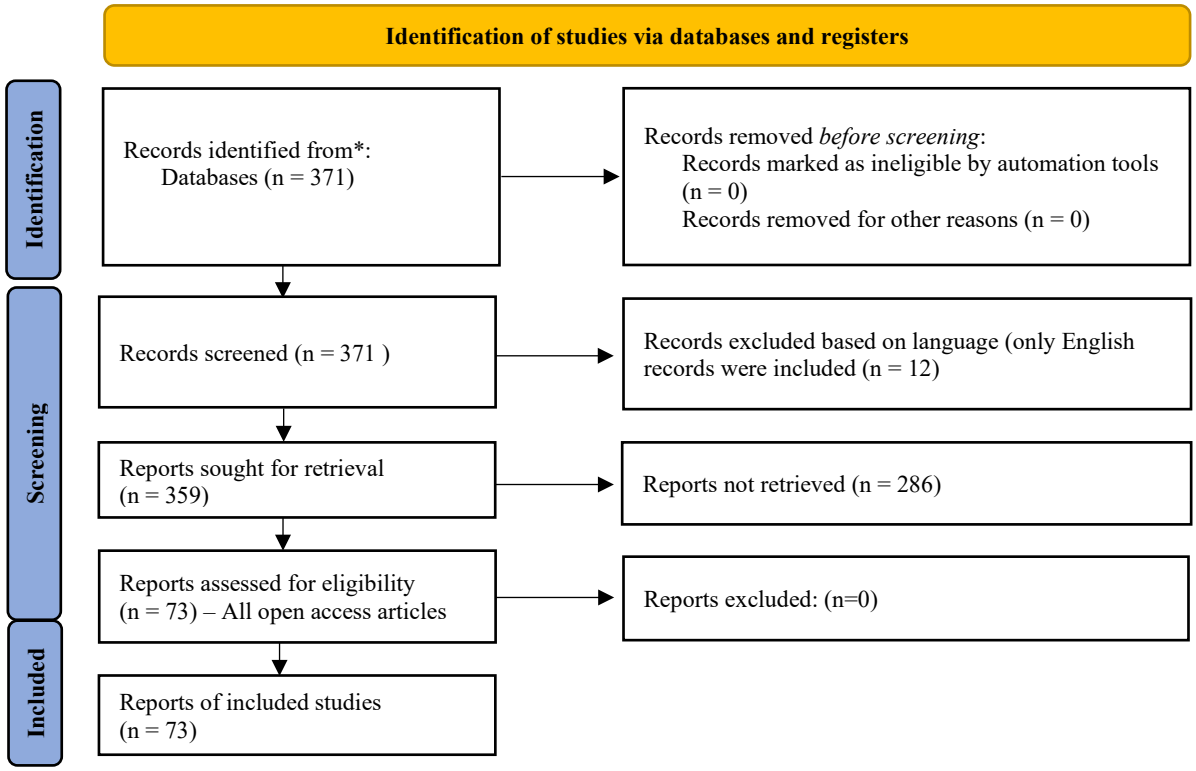


Figure 1. Prisma 2020 Flow diagram, selection, and analysis of articles.

A multi-step filtering process led to the inclusion of 73 documents for final analysis. The selected studies were assessed to extract evidence on DFI interventions in agriculture, including sustainable financing, technological support, and policy implementation. The filtering process, shown in Figure 1, followed PRISMA's systematic steps: identification, screening, eligibility, and inclusion, ensuring transparency and reproducibility.

2.3. Literature inclusion and exclusion criteria

The initial search on Scopus yielded 371 articles. To ensure relevance and quality, several criteria were applied. First, only English-language publications were considered, reducing the count to 359. Then, the dataset was limited to open-access documents to ensure accessibility, further narrowing the selection to 73 documents. These final articles were peer-reviewed and aligned with the research focus on DFIs in agricultural development. The selected studies provided insights into critical themes such as financial access, sustainable practices, technological innovation, and institutional strategies in the agricultural sector.

3. Results

To systematically present the findings of this study, an analytical framework was developed to organise and synthesise key insights from the 73 studies included in this systematic review. The results are structured into two main sections: (i) Analysis of scientific production, and (ii) Bibliographic Network Analysis and Visualization. This structure supports a comprehensive understanding of the role of DFIs in agricultural development.

3.1. Scientific production analysis

The analysis of scientific output related to Development Financial Institutions (DFIs) in sustainable agriculture shows a steady growth in scholarly interest. While publications remained limited between 1995 and the early 2000s, a notable increase began around 2016, with a significant surge between 2022 and 2024. This trend reflects a growing academic recognition of DFIs' importance in supporting agricultural sustainability and rural economic development. Author analysis identifies several key contributors to this field, including Adeyanju, Chumo, Gituro, Kirsten, Mburu, and Mignouna, whose recurrent publications highlight their expertise and influence. Overall, the findings reveal a diverse and interdisciplinary research landscape, with strong institutional and geographic representation, influential journals, and prominent scholars contributing to the expanding discourse on DFIs and their roles in promoting sustainable rural economies.

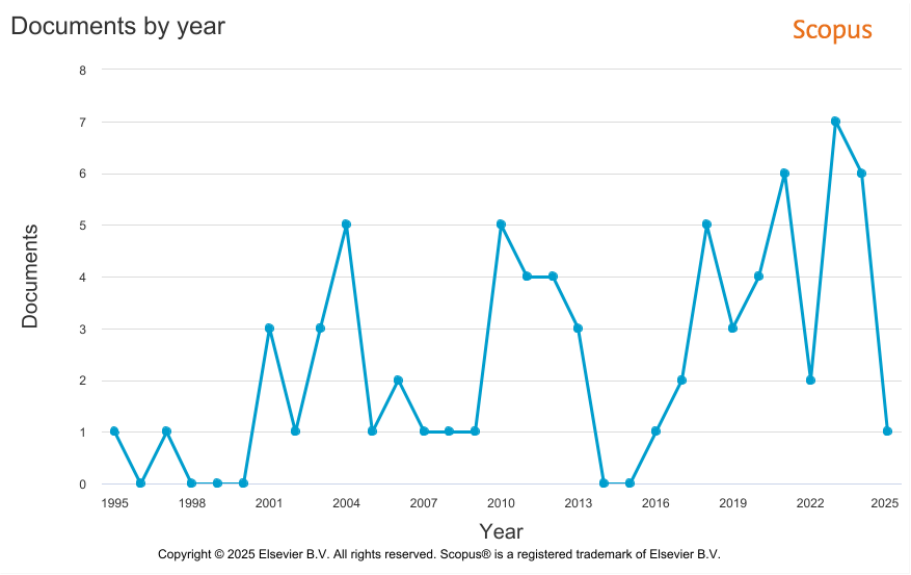


Figure 2. Publications by Year (Source: Scopus)

3.2. Bibliographic Network Analysis and Visualization

3.2.1. Citation Network Analysis

Citation Network Analysis (CNA) is a method in which papers are represented as nodes and citations as linkages between them. The capacity to trace the citation network made it possible to gain better insight into how earlier studies influenced subsequent ones and the ability to detect knowledge flows. As a result, smaller networks (clusters) that comprise papers are isolated, and everyone in the cluster has at least ten references with another. CNA enables the identification of papers that have received the most citations within the entire author network (weights) (Hummon & Dereian, 1989). The CNA is thought to produce the best results in clusters with many nodes since the amount of data obtained is substantially more than in small clusters (Ejsmont et al., 2020). The CNA in Table 1 (Máté et al., 2024) identified 42 distinct clusters, each representing a specific research theme in agricultural development and finance, evenly distributed with each cluster accounting for 2.38% of the total. For example, Cluster 1 focuses on green finance in agriculture (Budiasa, 2020), while Cluster 2 highlights health resilience to climate change (Hartinger et al., 2024). Clusters address diverse topics including water resource management (Hillbom, 2010), household production economics (Mendola, 2007), price policies in Sub-Saharan Africa (Thiele, 2003), land reform impacts (Kapuya et al., 2013), and rural food security (D'haese et al., 2013). Other themes include farm credit (Khandker & Faruqee, 2003), land rights (Sneath, 2001), community gardens (Shisanya & Hendriks, 2011), environmental assessments (Wu et al., 2020), poverty analysis (Kapungwe, 2004), and climate vulnerabilities (Epule et al., 2021).

Table 1. Research topics on the most significant clusters in the CNA

Cluster	Nodes	Topics	Top Cited Paper*	Period	Size** (%)
1	1	Agricultural Green Finance	Budiasa (2020)	2020	2.38
2	1	Climate Health Resilience	Hartinger et al. (2024)	2024	2.38
3	1	Water Resource Distribution	Hillbom (2010)	2010	2.38
4	1	Farm Production Theory	Mendola (2007)	2007	2.38
5	1	Agricultural Price Policy	Thiele (2003)	2003	2.38
6	1	Land Reform Zimbabwe	Kapuya et al. (2013)	2013	2.38
7	1	Rural Food Security	D'haese et al. (2013)	2013	2.38
8	1	Farm Credit Impact	Khandker & Faruqee (2003)	2003	2.38
9	1	Land Rights Pastoralism	Sneath (2001)	2001	2.38
10	1	Community Garden Security	Shisanya & Hendriks (2011)	2011	2.38
11	1	Ecological Remote Sensing	Wu et al. (2020)	2020	2.38
12	1	Zambian Poverty Trends	Kapungwe (2004)	2004	2.38
13	1	Crop Climate Vulnerability	Epule et al. (2021)	2021	2.38
14	1	Landscape Knowledge Sharing	Mcgonigle et al. (2020)	2020	2.38
15	1	Innovation Livelihood Malawi	Mapila et al. (2012)	2012	2.38
16	1	Enterprise Investment Climate	Kinda & Loening (2010)	2010	2.38
17	1	Youth Agripreneurship Skills	Adeyanju et al. (2023)	2023	2.38
18	1	Village Project Evaluation	Mitchell et al. (2018)	2018	2.38
19	1	Resource Revenue Mobilisation	Ndikumana & Abderrahim (2010)	2010	2.38
20	1	Food-Based Development Strategies	Kiess et al. (2001)	2001	2.38
21	1	Water Security Assessment	Holmatov et al. (2017)	2017	2.38
22	1	Poverty Measurement Techniques	Mulyasari et al. (2019)	2019	2.38
23	1	Sustainable Market Access	Faria et al. (2011)	2011	2.38
24	1	Entrepreneurship LDCs Africa	Brixiova (2010)	2010	2.38
25	1	Smallholder Support Strategy	Aliber & Hall (2012)	2012	2.38
26	1	Urban Water Infrastructure	Tellman et al. (2018)	2018	2.38
27	1	Resource Management Malawi	Mvula & Haller (2009)	2009	2.38
28	1	Household Economic Shocks	Kurosaki (2013)	2013	2.38
29	1	Mycelium Sustainability Africa	Akromah et al. (2024)	2024	2.38
30	1	Climate Finance Zimbabwe	Chirisa et al. (2021)	2021	2.38
31	1	MDBs Livelihood Resilience	Lipper et al. (2021)	2021	2.38
32	1	Burn Detection Landsat	Indratmoko & Rizqihandari (2019)	2019	2.38
33	1	Donor Performance Tradeoff	Heinzel et al. (2023)	2023	2.38
34	1	Inequality Growth Africa	Odedokun & Round (2001)	2001	2.38

Cluster	Nodes	Topics	Top Cited Paper*	Period	Size** (%)
35	1	Agricultural Productivity Efficiency	Nkamleu (2004)	2004	2.38
36	1	Agricultural Bank Efficiency	Musleh-Ud Din et al. (1997)	1997	2.38
37	1	Credit Agricultural Output	Iqbal et al. (2003)	2003	2.38
38	1	Expenditure Poverty Uganda	Fan & Zhang (2008)	2008	2.38
39	1	Donor Framework Agriculture	Akroyd (1995)	1995	2.38
40	1	CHP Rural Drying	Lamidi et al. (2017)	2017	2.38
41	1	Rural Employment Asia	Foster (2012)	2012	2.38
42	1	Farm Structure Development	Hayami (2002)	2002	2.38

*Source: Authors (*Minimum Citation: 5, **Nodes=42 (100%))*

Clusters also examine innovation systems (Mapila et al., 2012), agripreneurship (Adeyanju et al., 2023), development interventions (Mitchell et al., 2018), food strategies (Kiess et al., 2001), and water security (Holmatov et al., 2017). The diversity of topics—from sustainable materials (Akromah et al., 2024) to public investment (Fan & Zhang, 2008)—underscores the depth and breadth of research surrounding DFIs and agricultural development.

3.2.2. Global Citation Score and Normalized Citation Score Analysis

The Global Citation Score (GCS) captures the total number of citations a paper receives, while the Normalized Citation Score (NCS) adjusts for differences across publication years and fields, offering a fairer impact comparison (Knoke & Yang, 2019; Strozzi et al., 2017).

Table 2. Most cited articles ranked by Normalized Citations Score

Rank	Authors	Publication Year	Journal	Appearance In CNA	Citation Score	Normalized Citation Score
1	Heinzel et al.	2023	IOP Conference Series: Earth and Environmental Science	Yes	11	4.0526
2	Shisanya & Hendriks	2011	The Lancet Regional Health – Americas	Yes	48	3.3684
3	Hartinger et al.	2024	Development Southern Africa	Yes	20	3.3333
4	Aliber & Hall	2012	Asian Development Review	Yes	97	2.9846
5	Mitchell et al.	2018	African Development Review	Yes	39	2.9545
6	Epule et al.	2021	Development Southern Africa	Yes	19	2.7805
7	Sneath	2001	Development Southern Africa	Yes	55	2.75
8	Nkamleu	2004	Agricultural Economics	Yes	65	2.6639
9	Akromah et al.	2024	Inner Asia	Yes	15	2.5
10	Wu et al.	2020	Development Southern Africa	Yes	74	2.4667
11	Adeyanju et al.	2023	Ecological Indicators	Yes	6	2.2105
12	D'haese et al.	2013	Development Southern Africa	Yes	27	2.0769
13	Brixiova	2010	PLOS ONE	Yes	41	2.0707
14	Indratmoko & Rizqihandari	2019	Frontiers in Sustainable Food Systems	Yes	10	2
15	Odedokun & Round	2004	Development Southern Africa	Yes	47	1.9262
16	Khandker & Faruqee	2003	African Development Review	Yes	85	1.6038
17	Tellman et al.	2018	Heliyon	Yes	21	1.5909
18	Chirisa et al.	2021	The Lancet Global Health	Yes	10	1.4634
19	Ndikumana & Abderrahim	2010	African Development Review	Yes	27	1.3636
20	Iqbal et al.	2003	Food and Nutrition Bulletin	Yes	65	1.2264
21	Mcgonigle et al.	2020	Physics and Chemistry of the Earth	Yes	35	1.1667
22	Kinda & Loening	2010	Journal of International Studies	Yes	23	1.1616
23	Holmatov et al.	2017	Development Southern Africa	Yes	22	1.0476
24	Lipper et al.	2021	African Development Review	Yes	7	1.0244
25	Mendola	2007	Development Southern Africa	Yes	49	1
26	Mulyasari et al.	2019	PLOS ONE	Yes	5	1
27	Mvula & Haller	2009	Development Southern Africa	Yes	8	1
28	Musleh-Ud Din et al.	1997	Asian Development Review	Yes	7	1

Rank	Authors	Publication Year	Journal	Appearance In CNA	Citation Score	Normalized Citation Score
29	Fan & Zhang	2008	Advanced Sustainable Systems	Yes	77	1
30	Akroyd	1995	Sustainability (Switzerland)	Yes	10	1
31	Hayami	2002	Food Security	Yes	14	1
32	Lamidi et al.	2017	IOP Conference Series: Earth and Environmental Science	Yes	20	0.9524
33	Mapila et al.	2012	International Organization	Yes	25	0.7692
34	Kapuya et al.	2013	African Development Review	Yes	6	0.4615
35	Kurosaki	2013	African Development Review	Yes	6	0.4615
36	Faria et al.	2011	Pakistan Development Review	Yes	6	0.4211
37	Hillbom	2010	Pakistan Development Review	Yes	6	0.303
38	Budiasa	2020	African Development Review	Yes	9	0.3
39	Kiess et al.	2001	Project Appraisal	Yes	5	0.25
40	Kapungwe	2004	Energy Procedia	Yes	5	0.2049
41	Foster	2012	Asian Development Review	Yes	6	0.1846
42	Thiele	2003	Asian Development Review	Yes	9	0.1698

Source: Authors

Table 2 (Máté et al., 2024) presents the top 10 most cited articles by NCS. Heinzel et al. (2023) ranks first with an NCS of 4.0526, indicating significant influence despite 11 total citations. Shisanya and Hendriks (2011) follow with an NCS of 3.3684 and 48 citations, reflecting lasting relevance. Hartinger (2024) holds a high NCS of 3.3333, showing strong early impact. Aliber and Hall (2012) and Mitchell et al. (2018), with high citation counts and NCS values of 2.9846 and 2.9545 respectively, underscore their long-term significance. Additional influential works include Epule et al. (2021), Sneath (2001), Nkamleu (2004), and Akromah et al. (2024), all maintaining strong NCS values. Wu et al. (2020), despite 74 citations, holds a slightly lower NCS of 2.4667, still reflecting consistent academic engagement. These findings highlight both recent and foundational studies shaping the field of DFIs and agricultural sustainability.

3.2.3. Co-occurrence Analysis

Co-occurrence analysis explores how frequently keywords appear together across the reviewed literature. Each node in the network represents a keyword, and links reflect co-mentions in the same document (Callon et al., 1991; Ding et al., 2001). Using VOSviewer, 73 documents were analysed. Keywords were standardised by merging synonyms and abbreviations, and only those appearing in five or more documents were included (Khitous et al., 2020). Larger nodes indicate more frequent and significant terms (Ejsmont et al., 2020).

Figure 2 reveals that terms like “agricultural development,” “food security,” “climate change,” and “economic growth” are central to the discourse, reflecting core research themes. Regional terms such as “Sub-Saharan Africa,” “Asia,” and “Pakistan” show strong associations, suggesting geographic focus areas for DFI interventions. The presence of terms like “resilience,” “smallholder,” and “poverty” illustrates how DFIs are analysed in the context of rural economies and socio-economic development.

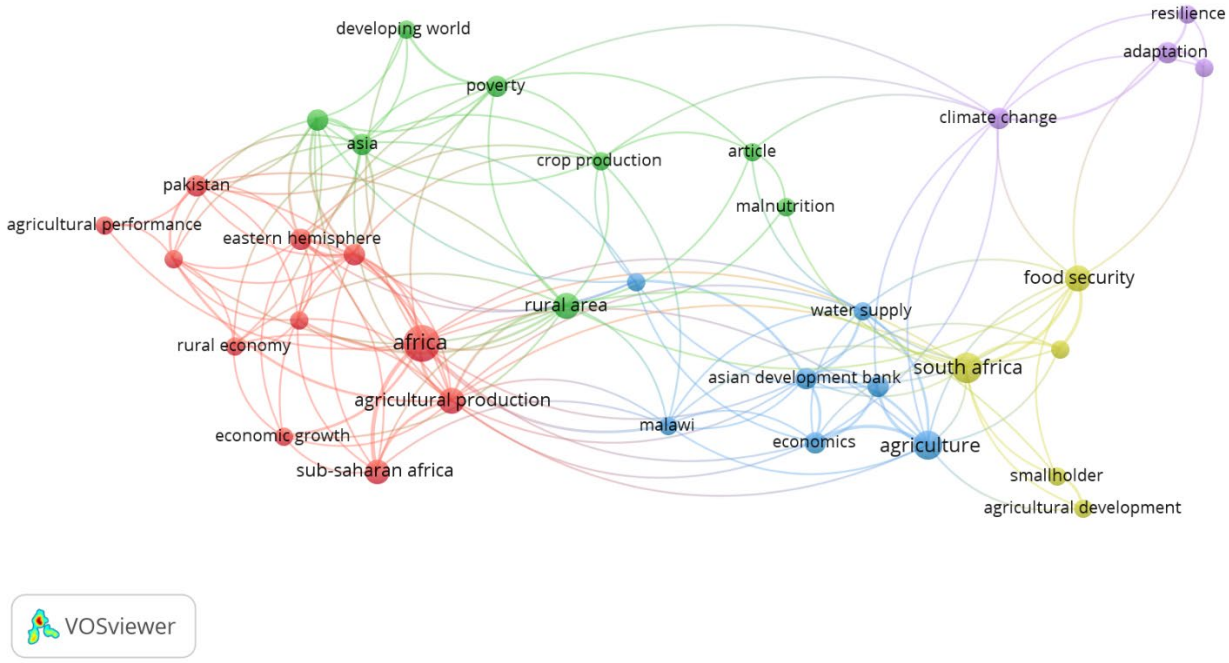


Figure 2. Co-occurrence Network of Keywords Visualisation

As shown in Table 3 (Máté et al., 2024), five thematic clusters were identified. Cluster 1 centres on rural finance and development in Africa and Pakistan, addressing credit provision and economic growth. Cluster 2 highlights poverty and food security in Asia and Eurasia, focusing on crop production and malnutrition.

Table 3. Main research topics based on CONK

Cluster	Keywords	Total Link Strength	Occurrences*	Main Research Topics
1	Africa	26	11	Rural Agricultural Finance and Development
	Agricultural Production	23	6	
	Sub-Saharan Africa	13	5	
	Eastern Hemisphere	18	4	
	Pakistan	11	4	
	World	18	4	
	Agricultural Performance	3	3	
	Credit Provision	12	3	
	Economic Growth	8	3	
	Low-Income Population	11	3	
	Rural Economy	7	3	
2	Rural Area	17	6	Poverty and Food Security in Asia and Eurasia
	Asia	16	4	
	Eurasia	16	4	
	Poverty	11	4	
	Article	6	3	
	Crop Production	10	3	
	Developing World	5	3	
	Malnutrition	3	3	
3	Agriculture	18	7	Agricultural Economics and Development Institutions
	Asian Development Bank	15	4	
	Economics	14	4	
	Sustainable Development	8	4	
	Land Use	9	3	
	Malawi	11	3	
	Water Supply	12	3	

4	South Africa Food Security Agricultural Development Food Supply Smallholder	15 14 4 8 5	8 6 3 3 3	Food Security and Smallholder Farming in South Africa
5	climate change adaptation mitigation resilience	11 8 6 4	4 4 3 3	Climate Change Adaptation and Resilience

Source: Authors (**Ranking Order, Min Number of Occurrences of a Keyword: 3*

Cluster 3 covers agricultural economics and institutional development, especially involving the Asian Development Bank. Cluster 4 focuses on smallholder farming and food security in South Africa, while Cluster 5 explores climate adaptation, mitigation, and resilience. These clusters reflect the diverse, yet interconnected themes shaping academic inquiry into DFIs' roles in sustainable agriculture and rural development.

4. Discussion and Implications

Development Financial Institutions (DFIs) play a critical role in financing sustainable agriculture and supporting rural economies by offering tailored credit schemes and green financing initiatives. Studies such as Budiasa (2020) and Khandker and Faruqee (2003) demonstrate that DFIs enhance agricultural productivity and promote sustainability through targeted financial interventions. In South Africa, Aliber and Hall (2012) underscore the significance of DFIs in supporting smallholder farmers and strengthening rural economic resilience. Strategically, DFIs have contributed to agricultural modernization by funding infrastructure and facilitating technological adoption. For example, Mitchell et al. (2018) and Holmatov et al. (2017) illustrate how investments in technology and water security have improved agricultural outcomes and resilience in developing regions.

Despite these contributions, DFIs face persistent challenges, including limited institutional capacity, financial constraints, and the high risks associated with agricultural lending. Kiess et al. (2001) and D'Haese et al. (2013) highlight difficulties in implementation and scalability, particularly in underserved rural areas. Overcoming these barriers requires institutional strengthening and enhanced collaboration among DFIs, governments, and private sector actors. Chirisa et al. (2021) and Fan and Zhang (2008) emphasize the need for improved governance, better-aligned financial instruments, and more coordinated development strategies.

The growing academic interest in DFIs—particularly since 2016, as shown by bibliometric and co-occurrence analyses—reflects rising policy attention to their role in sustainable agricultural development. Identified research clusters emphasize key themes such as rural finance, food security, technological innovation, and climate resilience, indicating that DFIs are increasingly seen as central actors in the transformation of agriculture toward sustainability.

5. Conclusions

This systematic review highlights the vital role of Development Financial Institutions (DFIs) in promoting sustainable agriculture and strengthening rural economies. DFIs contribute meaningfully through targeted credit schemes, technological investments, and infrastructure support, all of which enhance agricultural productivity and food security. Nevertheless, challenges remain, including limited institutional capacity, financial constraints, and the inherent risks associated with rural lending. Overcoming these challenges requires stronger institutional frameworks, increased financial mobilisation, and broader partnerships with governments and the private sector.

To enhance their impact, DFIs must adopt innovative and context-specific financial instruments while promoting inclusive and transparent governance. The growing academic and policy interest in this field reflects the increasing recognition of DFIs' strategic importance in advancing global sustainable

development goals. Strengthening their capacity and extending their reach will be essential for achieving agricultural transformation, reducing rural poverty, and building more resilient food systems.

References

Adeyanju, D., Mburu, J., Gituro, W., Chumo, C., Mignouna, D., & Mulinganya, N. (2024). Harnessing the job creation capacity of young rural agripreneurs: A quasi-experimental study of the ENABLE program in Africa. Social Sciences & Humanities Open, 9, 100791. DOI:10.1016/j.ssaho.2023.100791

Adeyanju, D., Mburu, J., Gituro, W., Chumo, C., Mignouna, D., Mulinganya, N., & Ashagidigbi, W. (2023). Can young agripreneurs improve their skills through agripreneurship empowerment programmes? Evidence from Africa. Heliyon, 9(1). DOI: 10.1016/j.heliyon.2023.e12876

Akromah, S., Chandarana, N., & Eichhorn, S. J. (2024). Mycelium composites for sustainable development in developing countries: The case for Africa. Advanced Sustainable Systems, 8(1), 2300305. DOI:10.1002/adsu.202300305

Aliber, M., & Hall, R. (2012). Support for smallholder farmers in South Africa: Challenges of scale and strategy. Development Southern Africa, 29(4), 548-562. DOI: 10.1080/0376835x.2012.715441

Akroyd, D. (1995). Steps towards the adoption of the Logical Framework Approach in the African Development Bank: some illustrations for agricultural sector projects. Project Appraisal, 10(1), 19-30. DOI:10.1080/02688867.1995.9726970

Brixiova, Z. (2010). Unlocking productive entrepreneurship in Africa's least developed countries. African Development Review, 22(3), 440-451. DOI: 10.1111/j.1467-8268.2010.00255.x

Budiasa, I. W. (2020, September). Green financing for supporting sustainable agriculture in Indonesia. In IOP Conference Series: Earth and Environmental Science (Vol. 518, No. 1, p. 012042). IOP Publishing. DOI: 10.1088/1755-1315/518/1/012042

Chirisa, I., Gumbo, T., Gundu-Jakarasi, V. N., Zhakata, W., Karakadzai, T., Dipura, R., & Moyo, T. (2021). Interrogating climate adaptation financing in Zimbabwe: Proposed direction. Sustainability, 13(12), 6517. DOI: 10.3390/su13126517

Cisilino, F., & Licciardo, F. (2022). Potential and Complexity of Implementing Financial Instruments in the Framework of Rural Development Policies in Italy—The Friuli Venezia Giulia Revolving Fund. Sustainability (Switzerland), 14(23). DOI:10.3390/su142316090

D'Haese, M., Vink, N., Nkunzimana, T., Van Damme, E., Van Rooyen, J., Remaut, A. M., ... & d'Haese, L. (2013). Improving food security in the rural areas of KwaZulu-Natal province, South Africa: Too little, too slow. Development Southern Africa, 30(4-5), 468-490.DOI: 10.1080/0376835x.2013.836700

Ejsmont, K., Gladysz, B., & Kluczek, A. (2020). Impact of Industry 4.0 on Sustainability—Bibliometric Literature Review. Sustainability, 12(14)10.3390/su12145650

Epule, T. E., Chehbouni, A., Dhiba, D., Etongo, D., Driouech, F., Brouziyne, Y., & Peng, C. (2021). Vulnerability of maise, millet, and rice yields to growing season precipitation and socio-economic proxies in Cameroon. Plos one, 16(6), e0252335. DOI: 10.1371/journal.pone.0252330035

Falagas, M. E., Pitsouni, E. I., Malietzis, G. A., & Pappas, G. (2008). Comparison of PubMed, Scopus, web of science, and Google Scholar: strengths and weaknesses. The FASEB Journal, 22(2), 338–342.

Fan, S., & Zhang, X. (2008). Public expenditure, growth and poverty reduction in rural Uganda. African Development Review, 20(3), 466-496.DOI: 10.1111/j.1467-8268.2008.00194.x

Faria, M., Mabaya, E., & Jordaan, D. (2011). Markets for marama beans in southern Africa: Linking sustainable products with sustainable livelihoods. Development Southern Africa, 28(4), 477-492. DOI: 10.1080/0376835x.2011.605566

Felizardo, K.R., Nakagawa, E.Y., Fabbri, S.C.P.F., Ferrari, F.C. (2017). Revisao Sistematica da Literatura em Engenharia de Software: Teoria e Pratica. Elsevier, Rio de Janeiro.

Foster, A. (2012). Creating good employment opportunities for the rural sector. Asian Development Review, 29(01), 1-28. DOI: 10.1142/s0116110511500144

Galvao, M.C.B., Ricarte, I.L.M., 2020. Systematic literature review: concept, production and publication. Logeion Filos. Da Inf. 6, 57–73.

García-Feijoo, M., Eizaguirre, A., & Rica-Aspiunza, A. (2020). Systematic Review of Sustainable-Development-Goal Deployment in Business Schools. Sustainability, 12(1)10.3390/su12010440

Hartinger, S. M., Palmeiro-Silva, Y. K., Llerena-Cayo, C., Blanco-Villafuerte, L., Escobar, L. E., Diaz, A., ... & Romanello, M. (2024). The 2023 Latin America report of the Lancet Countdown on health and climate change: the imperative for health-centred climate-resilient development. The Lancet Regional Health–Americas, 33. DOI: 10.1016/j.lana.2024.100746

Hayami, Y. (2002). Family farms and plantations in tropical development. Asian Development Review, 19(02), 67-89. DOI: 10.1142/s0116110502000088

Heinzel, M., Cormier, B., & Reinsberg, B. (2023). Earmarked funding and the control–performance trade-off in international development organisations. International Organization, 77(2), 475-495. DOI: 10.1017/s0020818323000085

Hillbom, E. (2010). Agricultural development and the distribution of water resources in Kgatleng District, Botswana. Development Southern Africa, 27(3), 413-427. DOI: 10.1080/0376835x.2010.498951

Holmatov, B., Lautze, J., Manthrithilake, H., & Makin, I. (2017). Water security for productive economies: Applying an assessment framework in southern Africa. Physics and Chemistry of the Earth, Parts A/B/C, 100, 258-269. DOI: 10.1016/j.pce.2017.04.007

Hummon, N. P., & Dereian, P. (1989). Connectivity in a citation network: The development of DNA theory. Social networks, 11(1), 39-63.

Indratmoko, S., & Rizqihandari, N. (2019, November). Burn area detection using Landsat 8 OLI TIRS. In IOP Conference Series: Earth and Environmental Science (Vol. 338, No. 1, p. 012035). IOP Publishing.DOI: 10.1088/1755-1315/338/1/012035

Iqbal, M. I., Munir Ahmad, M. A., & Kalbe Abbas, K. A. (2003). The impact of institutional credit on agricultural production in Pakistan. URL: https://www.jstor.org/stable/41260420

Kapungwe, A. (2004). Poverty in Zambia: Levels, patterns and trends. Development Southern Africa, 21(3), 483-507. DOI:10.1080/0376835042000265450

Kapuya, T., Meyer, F. H., & Kirsten, J. F. (2013). Modelling the impact of the 'fast track'land reform policy on Zimbabwe's maise sector. Development Southern Africa, 30(3), 417-436. DOI: 10.1080/0376835x.2013.797232

Khan, F. U., Nouman, M., Negrut, L., Abban, J., Cismas, L. M., & Siddiqi, M. F. (2024). Constraints to agricultural finance in underdeveloped and developing countries: a systematic literature review. International Journal of Agricultural Sustainability, 22(1)10.1080/14735903.2024.2329388

Khandker, S. R., & Faruqee, R. R. (2003). The impact of farm credit in Pakistan. Agricultural economics, 28(3), 197-213. DOI: 10.1016/s0169-5150(03)00017-3

Kiess, L., Moench-Pfanner, R., & Bloem, M. W. (2001). Food-based strategies: Can they play a role in international development?. Food and Nutrition Bulletin, 22(4), 436-442. DOI: 10.1177/156482650102200417

Kinda, T., & Loening, J. L. (2010). Small enterprise growth and the rural investment climate: Evidence from Tanzania. African Development Review, 22(1), 173-207. DOI: 10.1111/j.1467-8268.2009.00232.x

Knoke, D., & Yang, S. (2019). Social network analysis. SAGE publications.

Kurosaki, T. (2013). Dynamics of household assets and income shocks in the long-run process of economic development: the case of rural Pakistan. Asian Development Review, 30(2), 76-109. DOI: 10.1162/adev_a_00016

Lamidi, R. O., Wang, Y. D., Pathare, P. B., & Roskily, A. P. (2017). Evaluation of CHP for electricity and drying of agricultural products in a Nigerian rural community. Energy procedia, 105, 47-54.DOI: 10.1016/j.egypro.2017.03.278

Lipper, L., Cavatassi, R., Symons, R., Gordes, A., & Page, O. (2021). Financing adaptation for resilient livelihoods under food system transformation: the role of Multilateral Development Banks. Food Security, 1-16. DOI:10.1007/s12571-021-01210-7

Mapila, M. A., Kirsten, J. F., & Meyer, F. (2012). The impact of agricultural innovation system interventions on rural livelihoods in Malawi. Development Southern Africa, 29(2), 303-315. DOI: 10.108

Máté, D., Estiyanti, N. M., & Novotny, A. (2024). How to support innovative small firms? Bibliometric analysis and visualisation of start-up incubation. Journal of Innovation and Entrepreneurship, 13(1)10.1186/s13731-024-00361-z. DOI:10.1186/s13731-024-00361-z

McGonigle, D. F., Rota Nodari, G., Phillips, R. L., Aynekulu, E., Estrada-Carmona, N., Jones, S. K., ... & Zhang, W. (2020). A knowledge brokering framework for integrated landscape management. Frontiers in Sustainable Food Systems, 4, 13. DOI: 10.3389/fsufs.2020.00013

Mendola, M. (2007). Farm household production theories: A review of "institutional" and "behavioral" responses. Asian Development Review, 24(01), 49-68. DOI: 10.1142/s0116110507500047

Mitchell, S., Gelman, A., Ross, R., Chen, J., Bari, S., Huynh, U. K., ... & Sachs, J. D. (2018). The Millennium Villages Project: a retrospective, observational, endline evaluation. The Lancet Global Health, 6(5), e500-e513. DOI: 10.1016/s2214-109x(18)30065-2

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., Stewart, L.A., Estarli, M., Barrera, E.S.A., et al. (2016). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Rev. Espanola Nutr. Humana Dietetica 20, 148–160. DOI: 10.1186/2046-4053-4-1.

Mulyasari, G., Waluyati, L. R., & Suryantini, A. (2019). The importance of combining various methods in assessing poverty level: The case of marine capture fishermen in Bengkulu Province, Indonesia. Journal of International Studies Vol, 12(2). DOI: 10.14254/2071-8330.2019/12-2/15

Musleh-Ud Din., Ghani, E., & Qureshi, S. K. (1996). Scale and scope economies in banking: a case study of the Agricultural Development Bank of Pakistan. The Pakistan Development Review, 203-213.DOI: 10.30541/v35i3pp.203-213

Mvula, P. M., & Haller, T. (2009). Common pool resource management in Lake Chilwa, Malawi: A wetland under pressure. Development Southern Africa, 26(4), 539-553. DOI: 10.1080/03768350903181332

Ndikumana, L., & Abderrahim, K. (2010). Revenue mobilisation in African countries: Does natural resource endowment matter?. African Development Review, 22(3), 351-365. DOI: 10.1111/j.1467-8268.2010.00250.x

Nkala, P. (2023). Exploring Innovative and Sustainable Financing of Agriculture in Zimbabwe's Second Republic. Advances in African Economic, Social and Political Development (pp. 239–262). Springer Nature. DOI: 10.1007/978-3-031-30129-2_13

Nkamleu, G. B. (2004). Productivity growth, technical progress and efficiency change in African agriculture. African Development Review, 16(1), 203-222. DOI: 10.1111/j.1467-8268.2004.00089.x

Odedokun, M. O., & Round, J. I. (2001). Determinants of income inequality and its effects on economic growth: Evidence from African countries (No. 2001/103). WIDER Discussion Paper. DOI: 10.1111/j.1017-6772.2004.00093.x

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. bmj, 372. DOI: 10.1136/bmj.n71

Powell, K. R., & Peterson, S. R. (2017). Coverage and quality: A comparison of Web of Science and Scopus databases for reporting faculty nursing publication metrics. Nursing Outlook, 65(5), 572. DOI: 10.1016/j.outlook.2017.03.004

Pranckutė, R. (2021). Web of Science (WoS) and Scopus: The titans of bibliographic information in today's academic world. Publications, 9(1), 12.

Raifu, I. A., & Aminu, A. (2020). Financial development and agricultural performance in Nigeria: what role do institutions play? Agricultural Finance Review, 80(2), 231–254. 10.1108/AFR-06-2018-0045

Roever, L. (2017). Compreendendo os estudos de revisao sistematica. Rev. Soc. Bras. Clín. Med. 15, 127–130. http://fi-admin.bvsalud.org/document/view/r34d2.

Santos, C. M. D. C., Pimenta, C. A. D. M., & Nobre, M. R. C. (2007). The PICO strategy for the research question construction and evidence search. Revista latino-americana de enfermagem, 15, 508-511. DOI: 10.1590/S0104-11692007000300023

Serafini, P. G., de Moura, J. M., de Almeida, M. R., & de Rezende, J. F. D. (2022). Sustainable development goals in higher education institutions: a systematic literature review. Journal of Cleaner Production, 370, 133473. DOI: 10.1016/j.jclepro.2022.133473

Shisanya, S. O., & Hendriks, S. L. (2011). The contribution of community gardens to food security in the Maphephetheni uplands. Development Southern Africa, 28(4), 509-526. DOI: 10.1080/0376835x.2011.605568

Sneath, D. (2001). Notions of rights over land and the history of Mongolian pastoralism. Inner Asia, 3(1), 41-58. DOI: 10.1163/146481701793647750

Soundarya, M., & Jayabal, G. (2020). Farmers' opinion towards agriculture credit sanctioned by various financial institutions in tirunelveli district. International Journal of Scientific and Technology Research, 9(4), 2710–2717.

Strozzi, F., Colicchia, C., Creazza, A., & Noè, C. (2017). Literature review on the 'Smart Factory' concept using bibliometric tools. International Journal of Production Research, 55(22), 6572. DOI: 10.1080/00207543.2017.1326643

Tellman, B., McDonald, R. I., Goldstein, J. H., Vogl, A. L., Flörke, M., Shemie, D., ... & Veiga, F. (2018). Opportunities for natural infrastructure to improve urban water security in Latin America. PloS one, 13(12), e0209470. DOI: 10.1371/journal.pone.0209470

Thiele, R. (2003). Price incentives, non-price factors and agricultural production in Sub-Saharan Africa: A cointegration analysis. African Development Review, 15(2-3), 425-438. DOI: 10.1111/j.1467-8268.2003.00079.x

Wu, J., Wang, X., Zhong, B., Yang, A., Jue, K., Wu, J., ... & Liu, Q. (2020). Ecological environment assessment for Greater Mekong Subregion based on Pressure-State-Response framework by remote sensing. Ecological Indicators, 117, 106521. DOI: 10.1016/j.ecolind.2020.106521

Yaron, J. (2006). State-owned development finance institutions (SDFI): The political economy and performance assessment. Savings and Development, 30(1), 39–78.