

Institutional Finance for Agricultural Development: A Bibliometric Overview and Future Research Agenda

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Abstract: Agricultural finance is crucial for maintaining global food production, rural development, and economic growth. This study aims to review the already published research works on agricultural finance in the Scopus database. The main objective of this study is to analyze the research and development patterns in the field of agricultural finance. In this study, we have a bibliometric analysis of agricultural financing concepts to identify the pattern of research. For this study, data have been collected from the Scopus database. VOS viewer and R software are used for building and visualizing bibliometric networks. This bibliometric overview explores the context of agricultural finance research, to provide insights into its evolution, trends, and significant contributors. The study investigated a large corpus of scholarly publications from a specific period of 1985 to 2023 using bibliometric analysis approaches such as citation analysis, most relevant sources, most globally cited documents keyword analysis, etc. The study demonstrates the chronological progression of research issues, major journals, prolific writers, and influential organizations. It also identifies emergent themes and multidisciplinary collaborations. This study provides direction for future research in the agricultural finance field.

Keywords: Agricultural Finance, Bibliometric Analysis, Financing Concepts, Challenges, Citation.

JEL Codes: Q14, C88, G32 Q10, C81,

1. INTRODUCTION

Agriculture is a vital component that is intricately woven into the fabric of human subsistence and economic stability in the complex tapestry of global economies. Being the backbone of this industry, agricultural finance coordinates the flow of funds needed for investment, risk management, and agricultural output (Jin-xia *et al.*, 2014). Agricultural financing is crucial to the sustainability and advancement of agricultural systems around the world. It includes a wide range of financial services and processes meant to help farmers, agribusinesses, and

rural communities access finance, manage risks, and increase production. As the agricultural industry adapts to economic, environmental, and technological changes, knowing the landscape of agricultural finance research becomes increasingly vital. Agricultural finance is important for supporting the agricultural industry, which is essential for global food security, economic development, and sustainability (Kish & Fairbairn, 2017). This industry faces unique financial issues because of its inherent risks, seasonality, and reliance on external factors such as weather and market changes (Ahmad *et al.*, 2023). Consequently, providing suitable financial products and services customised to the needs of farmers, agribusinesses, and rural communities is critical for encouraging agricultural growth, resilience, and innovation. The agricultural financing landscape has changed dramatically in recent years, owing to technical breakthroughs, governmental reforms, and shifting market dynamics. Digital financial services, mobile banking, crop insurance schemes, and impact investment are some of the creative techniques that are changing how agricultural finance is offered and accessed. The need to optimize finance systems in agriculture is becoming more and more important as population growth and environmental concerns increase. The intersection of finance and agriculture impacts global food systems, lives, and landscapes, from smallholder farmers in underdeveloped countries to agribusiness corporations in industrialised regions (Bhalerao *et al.*, 2024).

Agricultural financing is an important part of the worldwide agricultural industry, helping to facilitate sustainable agricultural development, increase productivity, and ensure food security (Ben *et al.*, 2018). The dynamics of agricultural financing have changed dramatically over time as farmers, agribusinesses, and rural communities face increasingly complicated difficulties. This evolution is being pushed by a variety of variables, including technological advancements, climate change consequences, market volatility, and regulatory changes (Atnafe *et al.*, 2018). The issue of agricultural financing is a serious barrier for farmers and agribusinesses globally, particularly in developing economies. Access to inexpensive and suitable financial services continues to be a significant obstacle for smallholder farmers, limiting their ability to invest in modern inputs, adopt sustainable practices, and minimize risks. Traditional banking institutions sometimes view agricultural financing as high-risk due to reasons such as unpredictable weather, market volatility, and limited collateral options in rural areas. As a result, farmers may turn to informal sources of financing with high-interest rates, increasing their financial risk. Furthermore, agricultural funding gaps have been made worse by poor infrastructure, low financial literacy among farmers, and regulatory restraints. These constraints impede agricultural productivity, income stability, and rural economic growth, exacerbating food insecurity and poverty. Addressing the issue of agricultural financing, it necessitates a comprehensive approach that includes financial innovations, risk management tools, supportive policies, and capacity-building initiatives to empower farmers and strengthen agricultural systems in the face of evolving challenges like climate change and market dynamics (Croz *et al.*, 2019).

Since India's independence, the agricultural sector has been playing an important role in the growth of the economy. As most of India's rural population primarily depends on agriculture for their living, it become one of the important pillars of the economy (Bharti, 2018). The sector has been providing food, employment, and living to many since its origin. Despite so many positive arguments for the sector, the farmers are still facing huge problems with their farm-related activity. Among all those problems one of the major reasons is the lack of financial support available to the farmers. Farmers rely on agricultural financing to gain access to the funds and resources they need to invest in new agricultural inputs, equipment, and technology (Himire *et al.*, 2015). This, in turn, improves agricultural productivity, efficiency, and competitiveness. Furthermore, effective financial solutions such as credit facilities, insurance products, and risk management tools assist farmers in mitigating a variety of farming hazards, including weather uncertainty, market changes, and production risks. We all know that finance play a big role in every activity, whether it is profit-making or charity. Thus, it is important to look for solving the financial issues faced by farmers for their farm-related activity. Understanding the complexity and nuances of agricultural financing allows stakeholders to make better decisions, plan focused interventions, and execute policies that promote inclusive and equitable agricultural growth (Domeher & Abdulai, 2012). This paper is a valuable resource for researchers, practitioners, policymakers, and an individual interested in learning more about the changing landscape of agricultural financing and its implications for global food systems and rural communities.

This study presents a comprehensive bibliometric overview of agricultural finance, to analyse and synthesise existing research to identify trends, difficulties, and prospects in this vital topic. Using bibliometric analysis approaches, we delve into a massive collection of scientific publications, conference papers, and reviews spanning several decades. Through this comprehensive assessment, we aim to identify major themes, prominent writers, influential organisations, and new areas of research in agricultural finance.

2. LITERATURE REVIEW

Cotula *et al.* (2011) found that the recent surge in global food and energy prices has given lower- and middle-income countries a fresh lease on agricultural investment. Some food-importing nations are encouraging foreign land ownership as a way to guarantee long-term national food security. Companies are realising that foreign agricultural investments can yield significant profits when it comes to food, fuel, and other agricultural goods. Pandey *et al.* (2018) conducted a Bibliometric study on the relationship of agricultural credit with farmer distress. The study depicts that the development of the Indian economy is heavily dependent on agriculture, although the sector's state is deteriorating. Approximately 19% of the GDP is derived from the agriculture industry, which employs two-thirds of the nation's

people. The factors that lead to the requirement for rural agricultural credit are an irregular investment in fixed capital formation, rapid stochastic capital surge, and lack of simultaneity between the realization of net income and the act of expenditure for agricultural purposes. Martin *et al.* (2015) found that private financial players have been more involved in various aspects of the food industry in recent years, food studies researchers have focused more on the “financialization” of the food system. The implications of financial actors playing a larger role in the food system have received a lot of attention, but the historical interactions between these actors and the food system—particularly the state’s role as a mediator of agricultural finance—have received comparatively less attention. Beyond the major agricultural exporting nations like the United States (US), Canada, and the European Union (EU), the financialization of food and agriculture is spreading. In many developing nations, international organisations are pushing “financial inclusion” more and more as a means of assisting with the advancement and development of agriculture. Kumar *et al.* (2015) conducted a study on Public Investment in Agricultural Research and Extension in India. The study reveals that there has been a considerable structural change in agricultural Research & Extensions investments across sectors and states during the last five decades. Crop and fishery industries saw more R&E investments over time, whereas the livestock sector suffered. The states’ share of R&E investments decreased with time, while the centres increased proportionally. Investment returns varied by region, with states with stronger total factor productivity growth outperforming others in terms of relative returns. R&E investments in India’s crop sub-sector have yielded returns of about 50%. Lobell *et al.* (2013) pointed out that the demand to cultivate more land would decrease if agriculture could successfully adjust to the continuing changes in the climate while still maintaining productivity growth. The study findings suggest that while it may be most advantageous to invest in the least developed areas to achieve the main adaptation objectives, the net effect of this strategy on mitigation is minimal because the production gains in the benefited regions—which have abundant and relatively low yielding land—are more than offset by higher rates of land clearing. Investments in adaptation are more effective in mitigating climate change in high-yielding, land-scarce locations like Asia and North America. Mengoub (2018) pointed out that for Africa’s agricultural sector to grow and be organised, investments in agriculture are essential. The agricultural potential of Africa presents chances to be taken advantage of in terms of production intensification and value chain structuring. Agriculture investment (public, private, and international) is still weak despite its diversification. The transition to a contemporary, intensive form of agriculture necessitates the creation of an all-encompassing agricultural policy that considers several factors, including irrigation, input utilisation, and marketing facility organization. Eventually, it should result in an active agricultural sector that is fully integrated into the economies of African nations and adequate agricultural production to guarantee food security for the populace. Akber *et al.* (2022) found that Smallholders in

Indian agriculture have not made enough private on-farm investments. Long- and short-term private on-farm investment is, however, significantly crowded out by governmental spending on research, education, and the region that public canals service. In addition, institutional credit, advantageous agricultural terms of trade, and projected food demand all encourage private investment in Indian agriculture. Newman & Tarp (2020) identified that in less developed nations, exposure to weather-related shocks continues to be a major contributor to poverty, especially for farming households. One key factor in determining welfare is a household's capacity to deal with the aftermath of shocks and adjust to their frequency. Risk-mitigation techniques are particularly challenging in many rural areas since the credit and insurance markets are frequently underdeveloped. This is particularly true for farming households, whose investments carry a significant downside risk because of the possibility that weather shocks would have a negative impact on output. Koval *et al.* (2014) studied the role of the role of interactive marketing in agricultural investment attraction. The Internet offers fresh, cutting-edge approaches and tools for promoting products. Interactive marketing communications are a crucial element in the execution of international business ventures. Users from Germany, Poland, and the Ukraine attest to the widespread use of the Internet. The tendency for technological Internet devices to evolve is highlighted. It is vital to diagnose the obvious resources of businesses participating in the European market to enhance management. It is particularly relevant for attracting investments. Sebatta *et al.* (2014) mentioned that in Zambia, smallholder farmers encounter numerous obstacles when attempting to obtain financial services, such as restricted entry to financial markets. Even with the government's and the donor community's many reforms—including financial sector reforms—many rural farmers continue to live in poverty and have no access to safety nets like loans that help fight hunger and disease. Kambali & Panakaje (2022) made a review on Access to Agriculture Finance by Farmers and its Impact on their Income Agricultural financing is essential for increasing productivity in agricultural development operations. Farmers require timely financing for irrigation, mechanisation, and land expansion. The study found that smallholder systems, policies, and investments aim to enhance infrastructure, increase efficiency, finance services, and increase labour available through automation. Regulatory frameworks are in place to prevent financial institutions from charging exorbitant interest rates or taking unnecessary risks with people's savings or assets.

Despite the rising corpus of literature on agricultural finance, there are a few prominent gaps that require additional research and scholarly attention. One notable study gap is the use and impact of emerging financial technology (FinTech) in agricultural finance. While there is growing global interest and investment in FinTech solutions, there is little empirical study on their specific uses, efficacy, and consequences for agricultural financing. Understanding how digital platforms, mobile banking, blockchain technology, and data analytics may transform

access to finance, risk management, and value chain financing in agriculture remains a significant gap in the literature. Addressing these research gaps can have a considerable impact on advancing knowledge, guiding policy responses, and creating inclusive and sustainable agricultural finance ecosystems worldwide.

3. OBJECTIVES OF THE STUDY

1. To investigate the publication in the field of agricultural finance.
2. To find the research gap in the area of agricultural finance.
3. To analyze the research pattern and developments done in the area of agricultural finance.
4. To suggest future research scope in the area of agricultural finance.

4. METHODOLOGY

Bibliometric analysis is a quantitative tool for assessing and measuring the influence, relevance, and trends of scholarly writing in a certain topic or profession. It entails examining citation patterns, publishing output, authorship, collaboration networks, and keyword usage across a set of academic papers. Bibliometric analysis uses statistical and computational approaches to provide insights into the academic communication environment, identify significant authors, journals, and institutions, find research patterns across time, and estimate the effect of research outputs. This methodology can help institutions, academicians, and policymakers better comprehend the structure, evolution, and contributions of the knowledge domain. It supports the development of evidence-based policies in a variety of sectors, from science and technology to the social sciences and humanities, by helping to identify research needs, assess performance, follow scientific trends, and so on.

For conducting the bibliometric analysis, we have collected Scopus and Dimension database from 1985 to 2023. We have considered around 275 articles related to the study area in the English language. The keywords used are agricultural finance, agricultural credit, agricultural development, and institutional finance for agriculture. The data obtained were extracted in CSV format. For conducting the bibliometric analysis, R software with Biblioshiny command and VOS viewer software is used.

5. RESULTS AND DISCUSSIONS

We have obtained 275 research papers relating to the topic of agricultural finance. This analysis shows a rise in the number of researches publications after 2015.

The fig. 1 depicts the countries' scientific production. The countries with the most published papers are indicated in indigo color. On the other hand, light blue indicates the nations with the lowest scientific publications. The countries which are indicated in indigo

Table 1: Top 20 Countries Scientific Production

<i>Region</i>	<i>Frequency</i>
INDIA	104
USA	82
CHINA	68
UK	48
GERMANY	38
NETHERLANDS	30
INDONESIA	27
AUSTRALIA	23
KENYA	23
NIGERIA	23
SOUTH AFRICA	20
ETHIOPIA	19
GHANA	18
ITALY	16
CAMEROON	15
PAKISTAN	14
CANADA	13
SPAIN	13
TANZANIA	10
FRANCE	9

Source: Author’s own compilation

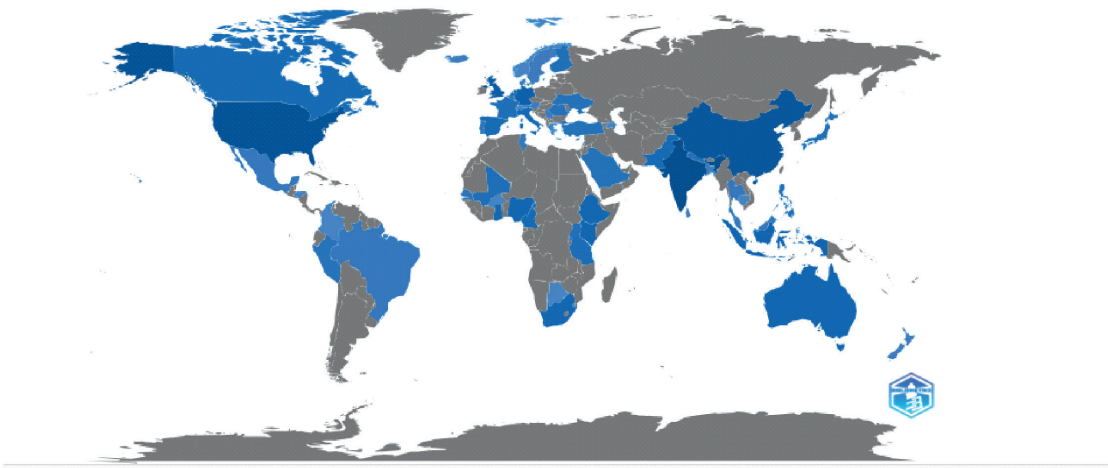


Figure 1: Country Scientific Production

Source: Author’s own compilation

color are mainly India, USA, China, UK, and Germany whereas the countries which are having minimum number of published documents are France, Tanzania, Spain, Canada, Pakistan, etc. It must be noted that among all the countries, India has the maximum number of documents published among all other countries. India has a large agricultural industry, a varied financial environment, and a strong academic community that is interested in agricultural economics and finance, which contribute to its top ranking in published papers on agricultural finance. Due to the large number of people working in agriculture, there is a high demand for research and knowledge sharing in fields including rural finance, risk management, and credit provision. India's scholarly activities, partnerships, and publications in agricultural finance are further encouraged by its progressive policies, government initiatives, and research institutions. This highlights India's wealth of knowledge and contributions to international discussions on sustainable agricultural development and financial inclusion in rural economies.

Table 2: Top 10 Most Global Cited Documents

<i>Paper</i>	<i>Total Citations</i>
SHIFERAW B, 2011, FOOD SECURE	678
YOUTIE J, 2008, RES POLICY	347
ABID M, 2016, SCI TOTAL ENVIRON	246
IMAI KS, 2010, WORLD DEV	175
STEENWERTH KL, 2014, AGRIC FOOD SECUR	157
TIAN L, 2015, LAND USE POLICY	151
ZOUGMORÉ R, 2016, AGRIC FOOD SECUR	112
NEWELL P, 2018, J PEASANT STUD	101
ABATE GT, 2016, WORLD DEV	91
COMBES MOTEL P, 2009, ECOL ECON	87

Source: Author's own compilation

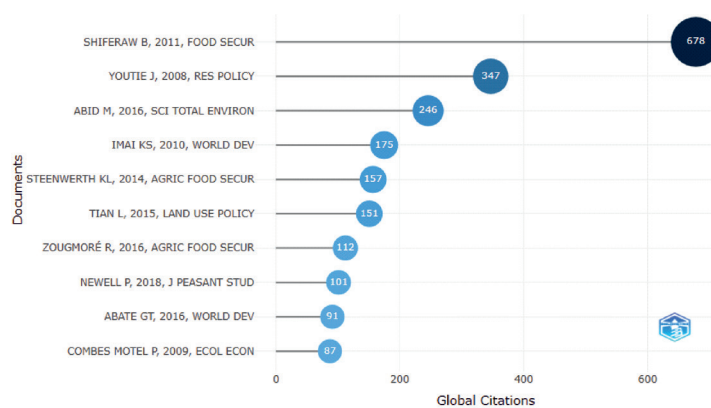


Figure 2: Most Global Cited Documents

Source: Author's own compilation

Research articles that have been cited by academics, organisations, and periodicals all across the world are referred to as globally cited works. Since research and information transmission are interconnected across national boundaries, these materials are valued for their influence, applicability, and contribution to the international academic community. The number of documents along with their total number of global citations can be seen in the fig.2. The data displays a list of the top 10 documents together with the corresponding number of citations worldwide. Several blue colour tones are used to represent the number of worldwide citations. When compared to other shades of blue, the darker the colour, the more global citations it has received and the more relevant the research topic is. Documents have global citations ranging from 0 to 1000. From the figure, it is clear that the article which is authored by SHIFERAW B, in the year 2011 has the highest number of global citations with 678 global cited documents as compared to the other given articles. The highest global citation is indicated by dark blue colour whereas the article authored by COMBES MOTEL P, in the year 2009 has the least number of 87 global cited documents and it is indicated by light blue colour.

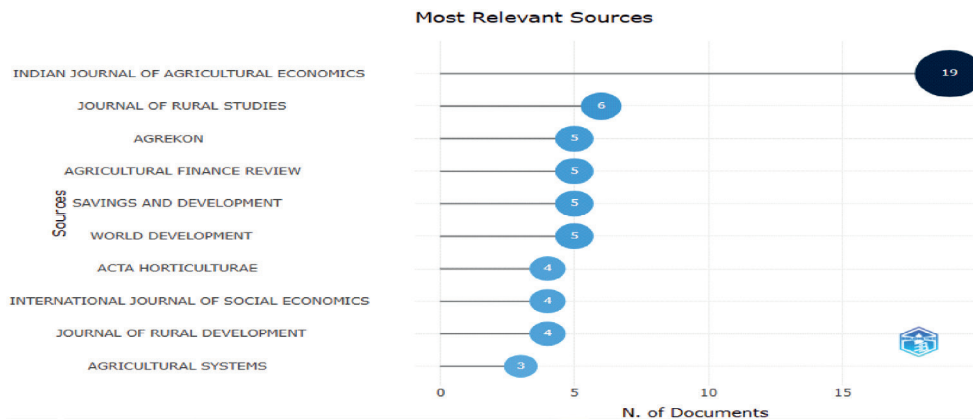


Figure 3: Most Relevant Sources

Source: Author’s own compilation

“Most relevant sources” in bibliometric analysis usually refers to well-known and often cited works in a certain field or subject. These sources are frequently important books, reputable periodicals, or prolific writers whose writings have greatly influenced the conversation and comprehension of the field. Finding the most pertinent sources aids in evaluating the significance, patterns, and major themes found in the literature. It also offers insightful information for citation analysis, additional research, and determining the intellectual heritage of concepts and ideas in the subject.

The number of research articles published by each journal about the topic of agricultural finance is shown in the Figure 3. The data shows the names of the top journals published

together with the interval of the number of documents published in a blue bar chart. The quantity and importance of the study theme are shown by the blue colour bar, which ranges from 0 to 20 in terms of the total number of papers published by all journals. Indian Journal of agricultural economics occupies the top position with total of 19 published documents which is the highest among all other given journals. It is noticed that the journal with the highest number of published documents is marked with a dark shade of blue colour whereas the journal with the least number of published documents is indicated in the light shade of blue colour. In this study journal “Agricultural systems” have only 3 published documents which is the least of all that’s why indicated in light shade of blue colour.

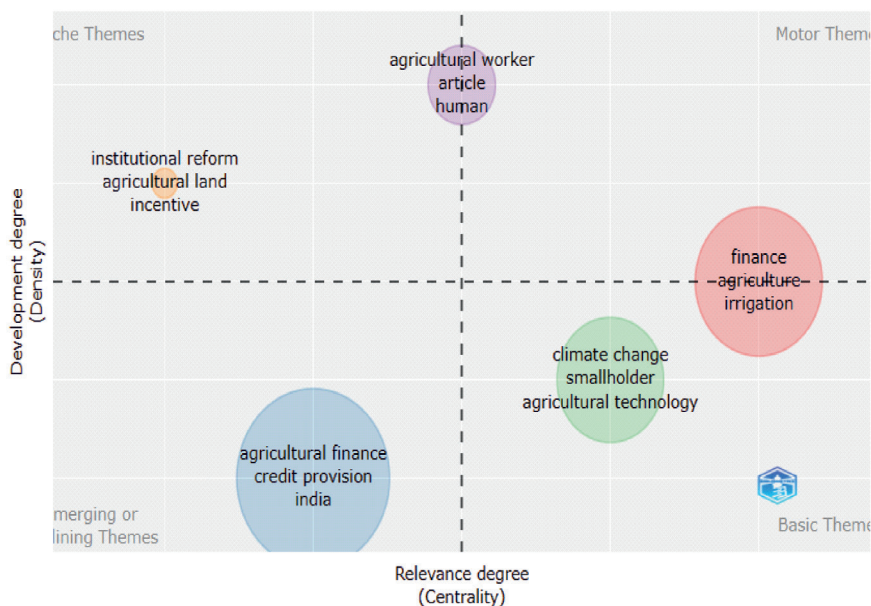


Figure 4: Thematic Map of author's Key Word in the field of Agricultural Finance

Source: Author's own compilation

In Fig.4 the thematic map presents four typologies of themes according to the authors' keywords, network analysis, and clustering. The motor theme, which stands for the high centrality and density keywords, is located in the top-right quadrant. Finance and agriculture are the keywords that tend to be the most developed in the field of agricultural finance. Due to their vital roles in supplying money, risk management instruments, and financial services necessary for agricultural productivity, sustainability, and rural development. These terms are essential to comprehending and developing the field of agricultural finance since they link financial concepts and procedures with farming operations. The Niche theme contains topics like institutional reform, agriculture land, and incentives. These themes are indicated by the

high density and low centrality. However, these themes are important because they concentrate on certain issues that are vital to improving rural development, sustainability, and agricultural output. Agricultural systems are shaped by regulatory frameworks, governance structures, and policy frameworks, all of which are addressed through institutional change. The bottom left quadrant is indicated by low centrality and density. These are the emerging or declining themes. These are indicated by the topics of agricultural finance and credit provision. These themes are evolving due to increasing recognition of their pivotal role in fostering sustainable agricultural practices, improving smallholder farmers’ livelihoods, and addressing financial inclusion challenges in rural areas. Finally, the lower right quadrant contains the basic themes marked by high centrality and low density. It contains the topics like climate change, smallholder, and agriculture technology. These topics are underutilized and need more focus of the researchers.

Table 3: Most Repeated Words with their Frequency

Terms	Frequency
agricultural	72
institutional	44
credit	43
agriculture	42
rural	38
farmers	31
finance	31
development	28
financial	25
India	21

Source: Author’s own compilation



Figure 5: Word Cloud of the most Frequent words

Source: Author’s own compilation

A word cloud is a graphic representation of text data in which words are shown in different sizes, each of which represents a word's importance or frequency in the text. In a word cloud, words that occur more frequently in the text are usually larger and more prominently shown, while those that appear less frequently are smaller. Word clouds are popular tools for text analysis and data visualisation in domains like data science, marketing, and content analysis because they may be used to rapidly identify important themes, subjects, or keywords in a big body of text. The Fig.5 contains the author's top 50 Keywords. Out of which the top 10 keywords which are frequently repeated and occurred a greater number of times are mainly agricultural, institutional, credit, agriculture, rural, farmers, finance, development, financial, and India. The repetition of keywords such as "agricultural," "institutional," "credit," "agriculture," "rural," "farmers," "finance," "development," "financial," and "India" in a word cloud of agricultural finance reflects their foundational importance within the field. These keywords encompass fundamental elements of agricultural finance, such as the agricultural industry itself, the institutional frameworks that oversee finance and policies, the availability of credit necessary for farmers and rural development, financial services and instruments that are vital for agricultural operations and development projects, and the particular context of India, a prominent participant in international agricultural finance discussions. The combination of these terms paints a complete picture of the multifaceted character of agricultural finance, emphasising the complex relationships it has with rural communities, financial institutions, development objectives, and geographic settings in addition to agriculture.

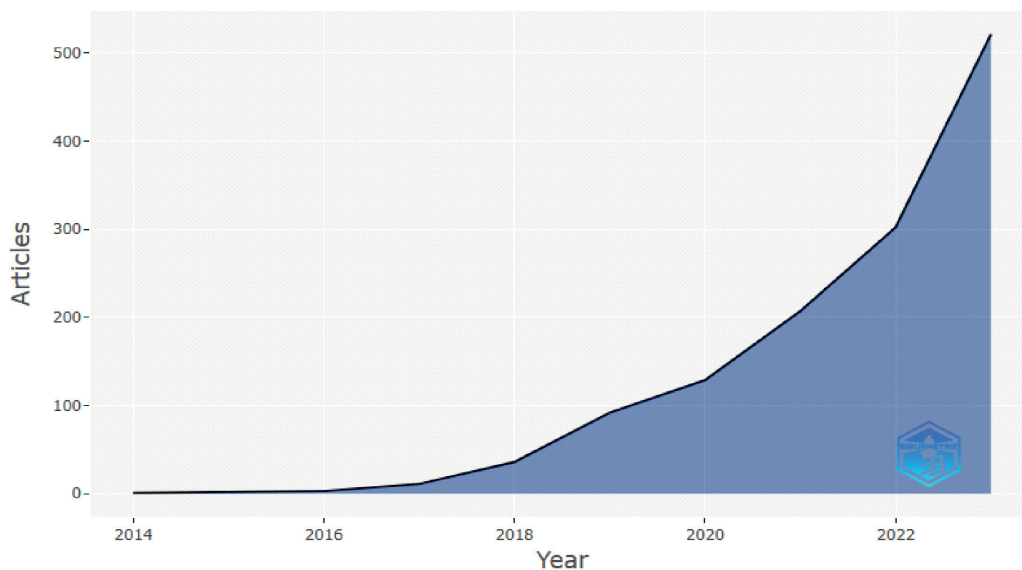


Figure 5: Annual Scientific Productions

Source: Author's own compilation

The quantity of academic publications, including journal articles, conference papers, and reviews, that are released in a given year or time frame is referred to as annual scientific production. Tracking yearly scientific production is crucial for bibliometric analysis since it helps uncover patterns in research output, comprehend trends, and evaluate the influence and expansion of scholarly activities within a certain subject or discipline. Researchers can learn more about research output, hot themes, trends in collaboration, and the general dynamics of scholarly communication in their field of interest by examining yearly data on scientific production.

From the Fig. 5 it is concluded that the trend of agricultural finance research was increasing tremendously. From the year 1985 to 2014 there was a slow growth in agricultural financing research. Several factors contributed to agricultural financing research's poor growth between 1985 and 1996. During this time, agricultural finance research may have received less attention or priority than other economic sectors. Additionally, global economic situations, policy shifts, and funding allocations may have impacted research priorities, perhaps emphasising other critical topics. Lack of technology improvements and data availability may also have limited agricultural finance research activity at the time. Furthermore, the intricacy of agricultural finance themes, as well as the field's interdisciplinary nature, may have caused problems for researchers, resulting in a slower development in published works in this sector. After 2014, the growth rate increased at a high rate. There are several important reasons for the sharp increase in agricultural financing research that began in 2014. First off, agricultural financing is becoming more widely acknowledged as a vital component of food security, rural livelihoods, and sustainable agricultural growth on a worldwide scale. A wave of research projects, funding possibilities, and partnerships aimed at tackling obstacles and prospects in agricultural finance have resulted from this increased consciousness. Additionally, interest in and study into new areas of agricultural finance have been sparked by developments in technology, data analytics, and financial innovations including impact investment, digital finance, and risk management tools. Additionally, the demand for equitable financial services, market instability, and growing worries about climate change have all contributed to the rise of agricultural financing research initiatives during this period.

From the year 1980, a small rise in the research work on this topic can be seen. Researchers across the globe started to evaluate agricultural financial issues. However, from the year 2015 a rapid increase in the number of research studies can be seen from the above table. A continuous increase is visible during this period which shows the increasing consciousness of the academicians towards the agricultural sector. The above diagram has been generated in R by using the `biblioshiny` command. Among all the publications, some authors' contributions can be highlighted by the number of documents published by them and their citations. Among all the authors, Mohammad Abid, Jurgen Scheffran and Farhad Zulfiqar have collaboratively

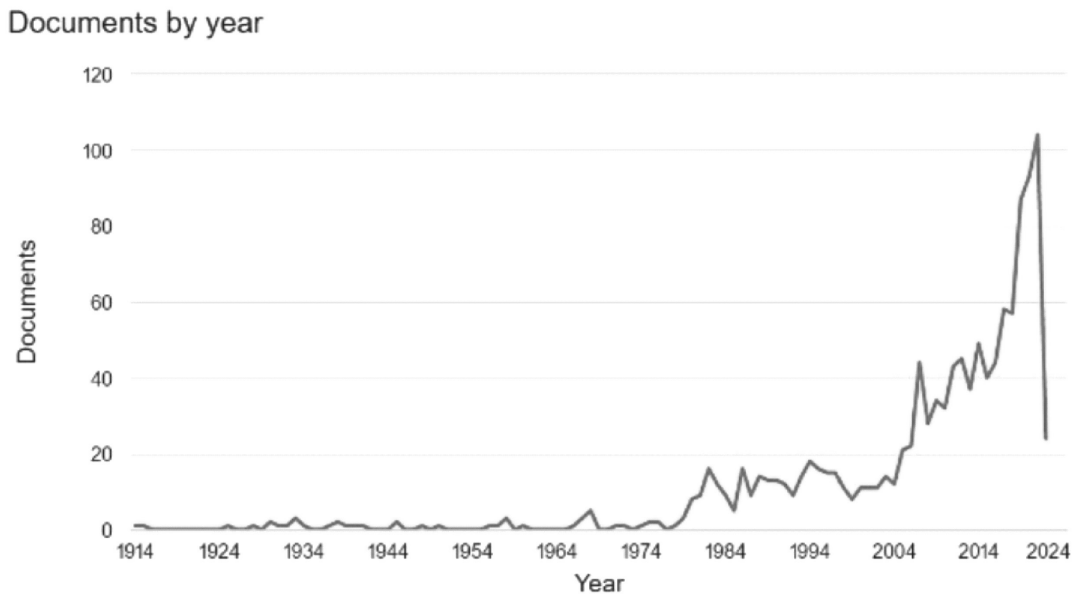


Figure 6: Number of Documents Published in different Years

Source: Author's own compilation

gained the highest number of citations in the field of agricultural finance research. The documents published by them in this area are 4 each. Prof. Abid, Prof. Scheffren and Prof. Farhad in their research overviewed the risk perception of farmers in their agricultural activity. They also considered the climate change condition's impact on the risk perception of farmers. In addition to this, he also studied the importance of social networks in farmers adaptation to the changing world. In their study, they showed the importance of smart farming for the development of the agricultural sector. They also focused on sustainable agriculture to ensure the sustainability of the sector in the economy.

The above figure shows the relationship between author's keywords. Most repeated keywords are Agriculture finance, agriculture, finance, and rural finance. The terms "agriculture finance," "agriculture," "finance," and "rural finance" all emphasise the field's interconnection and multidimensionality. "Agriculture finance" is a subset of finance that focuses on financial elements of agricultural activity, investments, and risk management. Meanwhile, the terms "agriculture" and "rural finance" refer to broader subjects such as agricultural methods, rural economies, financial services in rural areas, and farmer economic well-being. Researchers can get insights into the main subjects, research trends, and thematic areas within agricultural finance by analysing the co-occurrence and correlations between these terms, resulting in a better knowledge of the field's dynamics and developing research priorities. However, the

documents relating to the keyword agricultural finance were published on around the year 2010, which means no recent studies have been conducted in this area.

In bibliometric analysis, word networking refers to the links and linkages that exist between keywords, terms, and concepts in agricultural finance literature. Word network analysis provides useful insights into the structure, patterns, and evolving discourse within the literature, assisting academics in investigating the interconnectivity of ideas and suggesting potential study areas. Co-occurrence analysis, keyword clustering, and word association maps are common techniques used to visualize this networking. By analyzing word networks, researchers can uncover patterns, themes, and clusters of linked concepts in the area. When we put the crusher on the topic of agricultural finance, we can see the link of the topic with other topics. There is a total of 44 links to the topic. However the average publication year of the topic is 2012, which means no recent studies have been conducted in this area. The keywords such as “agriculture finance,” “financial provision,” “rural finance,” and “financial system” may form interconnected clusters, highlighting major issues and areas of attention in agricultural finance research.

6. CONCLUSION

This bibliometric review of agricultural finance takes an in-depth look at the field’s changing landscape and tendencies. The analysis of academic journals, citation patterns, and keyword networks revealed major issues and research objectives in agricultural finance. The assessment emphasises the importance of financial systems, loan provision, risk management measures, and policy interventions in promoting sustainable agricultural growth, increasing productivity, and addressing the issues that farmers and rural communities confront worldwide. Innovative financial tools, digital platforms, and impact investment techniques have also emerged, indicating a trend towards more inclusive and technology-driven approaches to agricultural finance. The review also emphasises the need for interdisciplinary collaboration, knowledge exchange, and evidence-based policymaking in fostering resilience, promoting financial inclusion, and achieving long-term sustainability in agricultural systems. The findings of this bibliometric analysis not only help to understand the current state of agricultural finance research, but also provide useful guidance for future research directions, interventions, and policy frameworks aimed at addressing agriculture’s complex and dynamic financial needs in a rapidly changing global context.

References

- Ahmad, A., Zoli, M., Latella, C., & Bacenetti, J. (2023). Science of the Total Environment Rice cultivation and processing: Highlights from a life cycle thinking perspective. *Science of the Total Environment*, 871(December 2022), 1–12. <https://doi.org/10.1016/j.scitotenv.2023.162079>.

- Akber, N., Paltasingh, K. R., & Mishra, A. K. (2022). How can public policy encourage private investments in Indian agriculture? input subsidies vs. public investment. *Food Policy*, *107*, 102210. <https://doi.org/10.1016/j.foodpol.2021.102210>.
- Atnafe, Y., Mugeru, A., El-shater, T., Aw-hassan, A., Piggan, C., Haddad, A., Khalil, Y., & Loss, S. (2018). Technological Forecasting & Social Change Enhancing adoption of agricultural technologies requiring high initial investment among smallholders. *Technological Forecasting & Social Change*, *134*(November 2017), 199–206. <https://doi.org/10.1016/j.techfore.2018.06.006>.
- Ben, R., Cunguara, B., & Thurlow, J. (2018). Linking agricultural investments to growth and poverty: An economywide approach applied to Mozambique. *Agricultural Systems*, *January*, 1–10. <https://doi.org/10.1016/j.agsy.2018.01.029>.
- Bhalerao, A. K., Kabir, K. H., Scheffran, J., Schr, L. S., & Schneider, U. A. (2024). Managing uphill cultivation under climate change – An assessment of adaptation decisions among tribal farmers in Nagaland state of India. *Journal of Environmental Management*, *349*(April 2023), 1–14. <https://doi.org/10.1016/j.jenvman.2023.119473>.
- Bharti, N. (2018). Evolution of agriculture finance in India: a historical perspective. *Agricultural Finance Review*, *78*(3), 1–18. <https://doi.org/10.1108/AFR-05-2017-0035>.
- Cotula, L., Vermeulen, S., Mathieu, P., & Toulmin, C. (2011). Agricultural Investment and International Land Deals: Evidence from a multi-country study in Africa. *Food Security*, *3*(S1), 99–113. <https://doi.org/10.1007/s12571-010-0096-x>.
- Croz, D. M., Sulser, T. B., Wiebe, K., Rosegrant, M. W., Lowder, S. K., Nin-pratt, A., Willenbockel, D., Robinson, S., Zhu, T., Cenacchi, N., Dunston, S., & Robertson, R. D. (2019). Agricultural investments and hunger in Africa modeling potential contributions to SDG2 – Zero Hunger. *World Development*, *116*, 38–53. <https://doi.org/10.1016/j.worlddev.2018.12.006>.
- Domeher, D., & Abdulai, R. (2012). Land registration, credit and agricultural investment in Africa. *Agricultural Investment in Africa*, *72*(1), 87–103. <https://doi.org/10.1108/00021461211222141>.
- Himire, R. G., Wen-chi, H. U., & Hrestha, R. B. S. (2015). ScienceDirect Factors Affecting Adoption of Improved Rice Varieties among Rural Farm Households in Central Nepal. *Rice Science*, *22*(1), 35–43. <https://doi.org/10.1016/j.rsci.2015.05.006>.
- Jin-xia, W., Ji-kun, H., & Jun, Y. (2014). Overview of Impacts of Climate Change and Adaptation in China' s Agriculture. *Journal of Integrative Agriculture*, *13*(1), 1–17. [https://doi.org/10.1016/S2095-3119\(13\)60588-2](https://doi.org/10.1016/S2095-3119(13)60588-2).
- Kambali, U., & Panakaje, N. (2022). A Review of Kambali, U., & Panakaje, N. (2022). A Review on Access to Agriculture Finance by Farmers and its Impact on their Income. *International Journal of Case Studies in Business, IT, and Education*, *6*(1), 302–327. <https://doi.org/10.47992/ijcsbe.2581.69>. *International Journal of Case Studies in Business, IT, and Education*, *6*(1), 302–327. <https://doi.org/https://doi.org/10.47992/IJCSBE.2581.6942.0166>.

- Kish, Z., & Fairbairn, M. (2017). Investing for profit, investing for impact: Moral performances in agricultural investment projects. *Environment and Planning A*, 0(0), 1–20. <https://doi.org/10.1177/0308518X17738253>.
- Koval, V., Kovshun, N., Kvitka, O., Kvitka, S., & Haran, O. (2014). The Role of Interactive Marketing In Agricultural Investment Attraction. *Section Environmental Economics*, 877–882. <https://doi.org/https://doi.org/10.5593/sgem2019/5.3>.
- Kumar, P., Kumar, P., & Parappurathu, S. (2015). Public Investment in Agricultural Research and Extension in India. *European Journal of Development Research Vol.*, 27(3), 438–451. <https://doi.org/10.1057/ejdr.2015.36>.
- Lobell, D. B., Baldos, U. L. C., & Hertel, T. W. (2013). Climate adaptation as mitigation: the case of agricultural investments. *ENVIRONMENTAL RESEARCH LETTERS*, 4, 1–12. <https://doi.org/10.1088/1748-9326/8/1/015012>.
- Martin, S. J., Clapp, J., Martin, S. J., & Clapp, J. (2015). Finance for Agriculture or Agriculture for Finance? *Journal OfAgrarian Change*, 15(4), 549–559. <https://doi.org/10.1111/joac.12110>.
- Mengoub, F. E. (2018). Agricultural Investment in Africa: *OCP Policy Center, January*, 1–10.
- Newman, C., & Tarp, F. (2020). Shocks and agricultural investment decisions. *Food Policy*, 94(November 2019), 101810. <https://doi.org/10.1016/j.foodpol.2019.101810>.
- Pandey, B., Bandyopadhyay, P., Kadam, S., & Singh, M. (2018). Bibliometric study on relationship of agricultural credit with farmer distress. *Management of Environmental Quality: An International Journal*, 29(2), 278–288. <https://doi.org/10.1108/MEQ-03-2017-0029>.
- Sebatta, C., Wamulume, M., & Mwansakilwa, C. (2014). Determinants of Smallholder Farmers' Access to Agricultural Finance in Zambia. *Journal of Agricultural Science*, 6(11). <https://doi.org/10.5539/jas.v6n11p63>.