

A Bibliometric Analysis on Agricultural Finance in India

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ABSTRACT

The rapid development of digital technology has brought new opportunities for agricultural development. 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. Agricultural finance is essential for modernizing farming and enhancing global food security, yet sustainable financial services remain challenging in remote areas. Agriculture finance empowers poor farmers to increase their wealth and facilitates the development of food value chains for feeding 9 billion people by 2050. Rural areas and agriculture in developing countries face a significant shortage of investment capital and financial services, hindering productivity and income for smallholder households and enterprises. Addressing this challenge demands substantial investment. This study reviews published research on agricultural finance from the Web of Science database, focusing on research and development patterns in India. It employs bibliometric analysis using VOS viewer and R software to visualize networks, exploring the evolution, trends, and significant contributors within agricultural finance research. This study reviews a large collection of scholarly publications of a specific period from 1991 to 2024. The study employs Citation analysis, keyword analysis, most relevant sources, most cited documents etc. The study finds A.A as the most relevant author from India. The study outlines research advancements, key journals, prominent authors, influential organizations, emerging themes, and future directions in agricultural finance.

Keywords: Agricultural finance, Farmers, India, Rural financing concepts, Bibliometric analysis

1. INTRODUCTION

The term "agricultural finance" denotes a combination of credit, saving, and insurance. The term is thus a very comprehensive one that covers virtually every instrument used in the banking and non-banking sectors of the economy. The term itself completely includes virtually all the parameters needed to ensure economically viable and culturally appropriate crop, tree, domestic animal, and fish cultivation techniques. So, those who use these techniques are well supported by officially recognized insurance companies, savings and credit cooperatives, as well as commercial and thrift banks. Additionally, rural credit and other banks, export-import banks, regional development banks, and microcredit institutions also serve some individuals appropriately.

Many species of trees, including fruit, nut, tea, coffee, and rubber trees, as well as trees that help lesser-known non-timber forest product species grow and financially mature, are important to individuals, corporations, and governments. Since many of the products created by tree species are inappropriate to

the inclusion criterion "crops," including words that further clarify the term "agricultural finance" may appear to be normatively appropriate and desirable. However, upon reflection, it becomes clear that many distinct types of living species, including food-harvest plant species and all other plant and animal species that are important to virtuous life, economic well-being, economic growth, and sustainable economic development, are appropriately excluded from this finance-inclusive definition.

Since gaining independence, the agricultural industry has been crucial in the economic development of India. Since a majority of India's rural population relies on agriculture as their main source of income, it has become a vital component of the economy (Bharti, 2018). Since it was founded, the industry has been supplying sustenance, jobs, and housing to a large number of people. 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. 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 analyze 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 organizations, and new areas of research in agricultural finance.

This paper is organized as follows: Section 2 discussed a review of the literature. Section 3 discusses the study's parameters and analytical approach. The analysis's findings are presented and explained in Section 4, and Section 5 ends with conclusions on how to apply this method to identify potential gaps in the corpus of current literature and discuss the novel study subjects.

2. LITERATURE REVIEW

Singh et al. (2023) conducted a study on farming finance, productive requirements, and NABARD's role in agricultural development. Findings reveal that higher interest rates lead to lower demand for loans and hinder farming businesses in Bihar, which heavily rely on available funds at favorable rates. Prakash Pradhan, Shakti Ranjan Mohapatra, and Deepak Kumar Sahoo (2024) conducted an empirical study on the types of loans for farmers and institutional credit to output ratio in Indian agriculture. They found various loan schemes available, with a 1.28 ratio of institutional credit to total output in 2022. Killokoqi, A. et al. (2024) researched financial challenges in Kosovo's agricultural enterprises, comparing financing methods with EU countries. Study shows loans as main financing method, with bureaucratic procedures hindering funding. This study analyzes government policies on agricultural financing in Egypt, Morocco, Nigeria, and South Africa, focusing on addressing challenges like high risks, banks' risk aversion, and insurers' reluctance to improve economic growth. Swamy, V. and M.D. (2016) analyze agricultural value chain financing in India through multiple case studies. They provide recommendations for improving existing models, stressing the importance of reviewing lead actors, business models, and sustainability

strategies. Understanding financing options and fund flow is crucial for enhancing model effectiveness and reducing lending risks. Swamy, V. and M.D. (2016) analyze agricultural value chain financing in India through multiple case studies. They provide recommendations for improving existing models, stressing the importance of reviewing lead actors, business models, and sustainability strategies. Understanding financing options and fund flow is crucial for enhancing model effectiveness and reducing lending risks. Chen, K.Z. et al. (2015) explores policy interventions in agricultural finance and their relation to the current microfinance industry. Data was collected from the Reserve Bank of India Archive Museum in Pune. The study concludes that past interventions, if implemented, could have resulted in India being a leader in financial inclusion. Sandhu, N. (2021) examines financial obstacles for small farmers in India and how bank managers determine loans. Findings from a survey with 42 banks and 185 farmers in Punjab reveal reliance on private and public sectors, with non-quantifiable factors impacting lending decisions and hindering economic growth. Sandhu's 2021 study on the impact of institutional agricultural credit on crop productivity among small and marginal farmers in India found that it significantly enhances crop yields, despite the use of propensity score matching. Yadav and Goyari's 2024 study found a significant link between financial development and crop productivity in India from 1980 to 2020, with financial development having a long-term 1.55% impact and a short-term 40% impact. The study by Yadav and Rao (2023) investigates the access and disparity of institutional agricultural credit for small and marginal farmers in three Indian states. Data was collected from 400 farmers from various social groups. Results suggest that socially advantaged groups have better access to agricultural assistance. Oloukoi, L. (2022) examines the impact of credit and real interest rate shocks on agricultural value added in the West African Economic and Monetary Union (WAEMU). It uses a panel VAR model and an autoregressive distributed lag model to analyze the effects of agricultural credit on agricultural value added. Results show that credit stimulates value added in the medium and long term. Saqib, L. et al. (2015) explores the application of Qard-al-Hasan (QH) in agricultural farming to provide Riba-free financing for Muslim farmers in Islamic countries like Pakistan. The research highlights the need for QH to meet the financial needs of poor Muslim farmers who cannot rely on interest-based financing due to Riba prohibition. Abd Rahman et al. (2022) propose a Manihah Agricultural Financing Model to address Malaysia's abandoned lands and food security issues. The model incorporates manihah within Malaysia's agricultural and Islamic financial industries, addressing gaps in existing literature and secondary data.

2.1 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

3. METHODOLOGY

A quantitative method for evaluating and quantifying the impact, pertinence, and patterns of academic writing in a certain field or field is bibliometric analysis. It comprises looking at authorship, collaborative networks, publishing output, citation patterns, and keyword usage throughout a collection of scholarly works. Bibliometric analysis employs statistical and computational methods to uncover research trends over time, identify important authors, journals, and institutions, assess the impact of research outputs, and offer insights into the academic communication environment. Institutions, scholars, and policymakers can all gain a better understanding of the composition, development, and contributions of the knowledge

domain with the use of this methodology. From the social sciences and humanities to science and technology, it aids in the creation of evidence-based policies by assisting in the identification of research requirements, performance evaluation.

For conducting the bibliometric analysis, we have collected Web Of Science(WOS) database from 1991 to 2024. We have considered around 498 articles related to the study area in the English language. The keywords used are Agricultural finance, Farmers, India, Rural financing concepts, Bibliometric analysis. The data obtained were extracted in CSV format. For conducting the bibliometric analysis, R software with Biblioshiny command and VOS viewer software is used.

4. RESULTS AND ANALYSIS

This section organized as follows main information about the data, annual scientific production, most relevant affiliations, co-authorship network map, co-occurrence and all keywords network map followed by bibliographic coupling with documents and sources.

4.1 Main information about data

Figure-1 provides a general overview data. There were 498 selected articles from from 285 journals during 1991-2024. 9656authors has contributed their researches in this field of agricultural financing.



Figure-1: Main information about data

4.2 Annual Scientific Production

Figure-2 represents the annual scientific production increases over the year where 2023 was the most productive year with 83 articles followed by 2024 with 80 articles and 2022 with 79 articles.

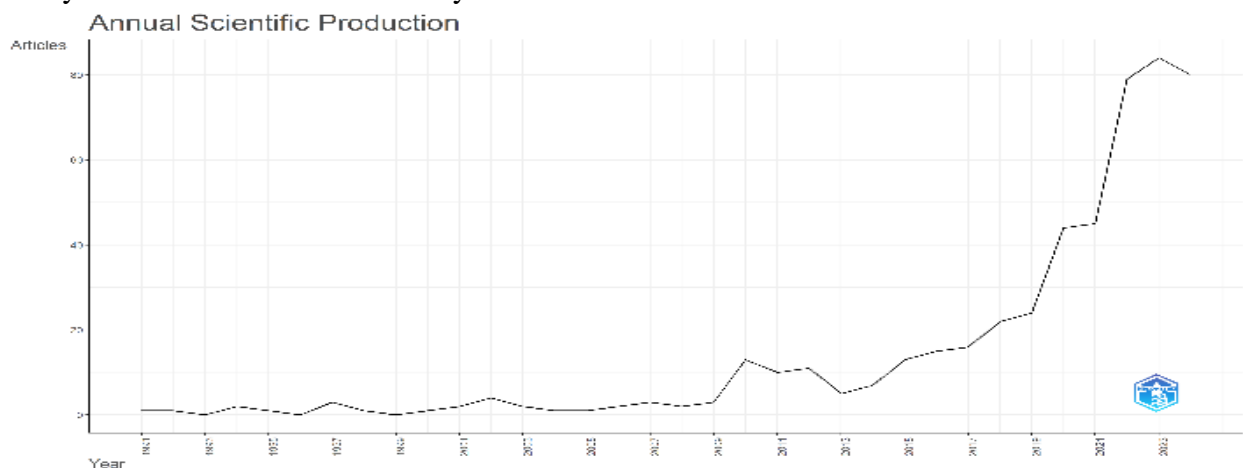


Figure-2: Annual Scientific Production

4.3 Most relevant affiliations

According to the analysis, University of Medical Sciences in Tehran has published 293 articles, followed by Kermanshah University of Medical Sciences with 162 articles. This shows that agricultural finance has evolved as an emerging topic.

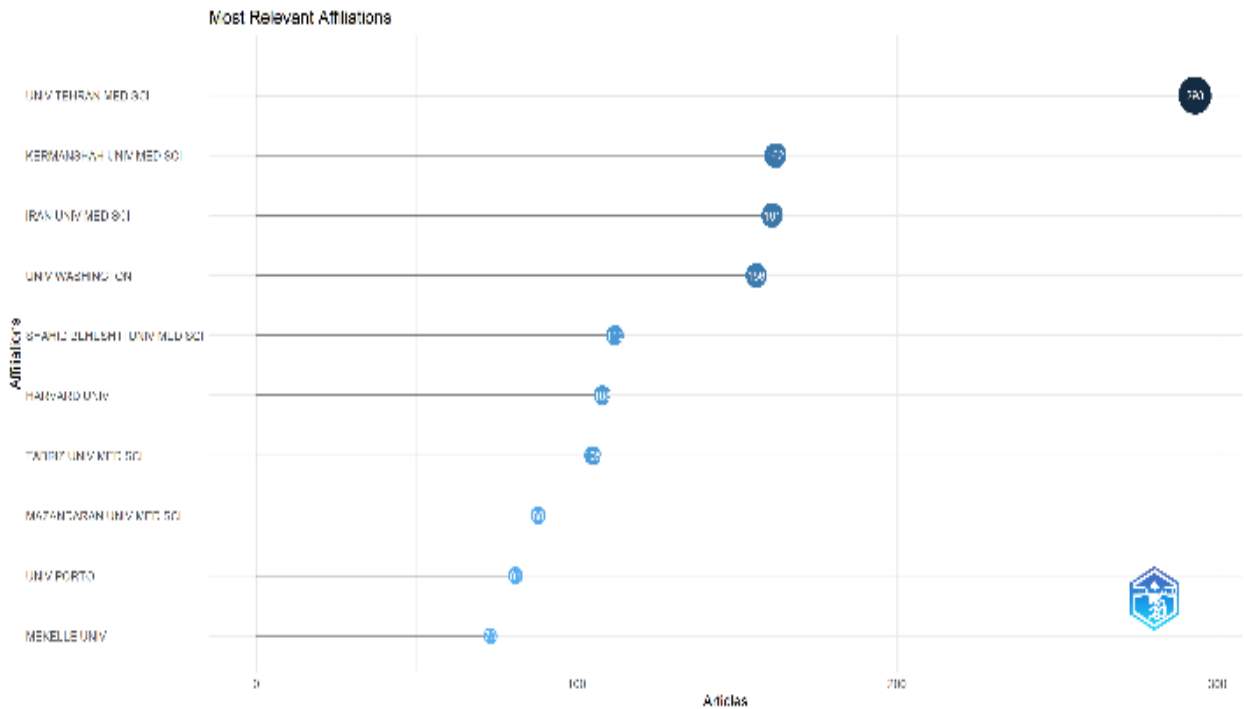


Figure-3: Most Relevant Affiliations

4.4 Co-authorship Network Map

We used co-authorship analysis to determine the collaborative relationship between authors that depicted by nodes. Based on the figure, the strength of the collaborative relationship was reached by Qi, Yanbin with 11 link strength (LS). Qi, Yanbin was connecting to all of the clusters. It means that he formed many relationships through co-authorship, which has indirectly influenced research on agricultural finance literature.

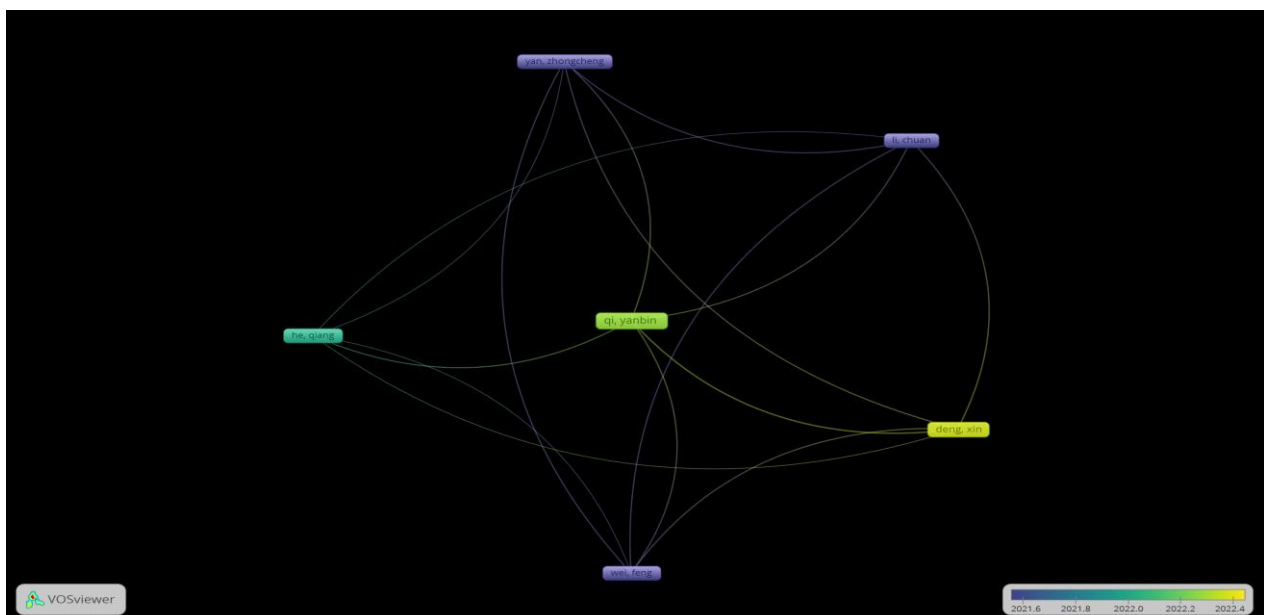


Figure-4: Co-authorship Network Map

4.5 Co-occurrence and All keywords Network Map

We use co-occurrence (co-word) analysis to examine the most prevalent keyword discussed in the agricultural finance literature. Co-occurrences occur when two keywords appear together in an article, indicating a connection between the two concepts. We use five threshold as minimum number of occurrences. Therefore, we find 7 clusters from 122 keywords that meet the threshold from the total of 988 keywords as shown in the figure below.

Based on the map, there are seven clusters, the cluster-1 (n=25) is the most used keyword involving agricultural policy, adaptive capacity, technology and agricultural supply chain. Cluster-2 (n=24) represents agricultural credit, agricultural finance, microfinance and productivity as most used keywords. Cluster-3 (n=21) shows that bio-diversity, challenges, climate and ecosystem services has been used many times. Cluster-4 (n=16) shows adoption, agriculture, agricultural extension and crop insurance are most used keywords. Cluster-5 (n=15) represents agroecology, financial inclusion and sustainable agriculture are the most used keywords whereas cluster-6 (n=12) and cluster-7 (n=7) represents small holder farmers, technology adoption and food security are the most used keywords.

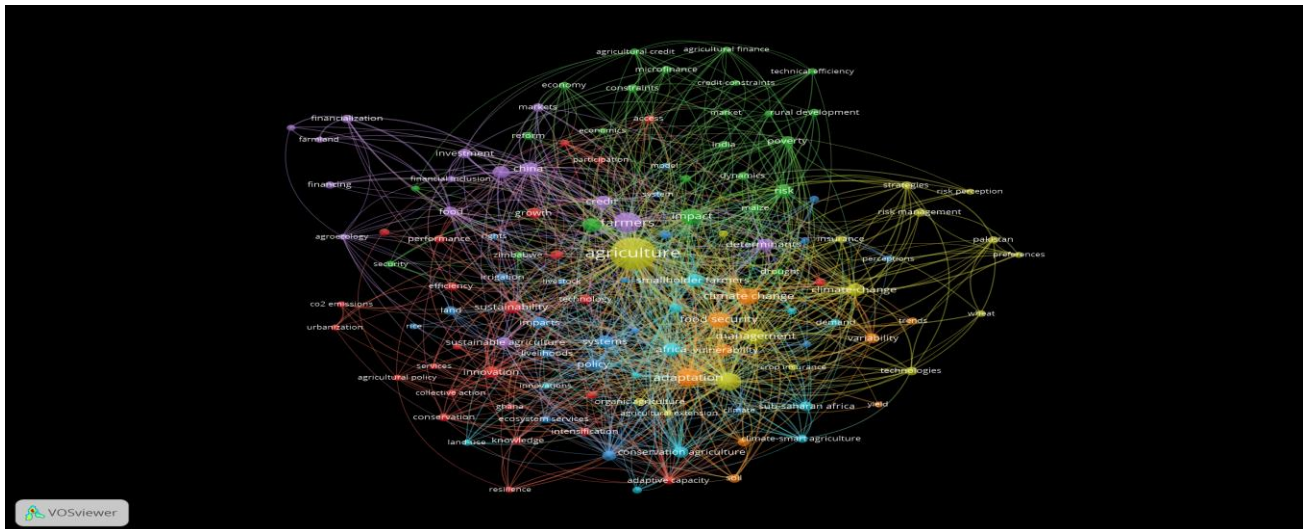


Figure-5: Co-occurrence and all keywords network

4.6 Bibliographic Coupling with documents

We use a bibliographic coupling analysis to discover core items in our dataset. This widely used technique performs automatic clustering on large datasets. This figure depicted the article that represent by the author. We limit five thresholds at minimum number of citations. Therefore, there are fourteen clusters out of 249 documents meet the threshold. Our result shows that the document most co-cited are articles by Lipper (2014). However, based on the link strength among the articles, the article entitled ‘Understanding the adoption of climate-smart agriculture: a farm-level typology with empirical evidence from southern malawai’ has the highest link strength with 95 LS.

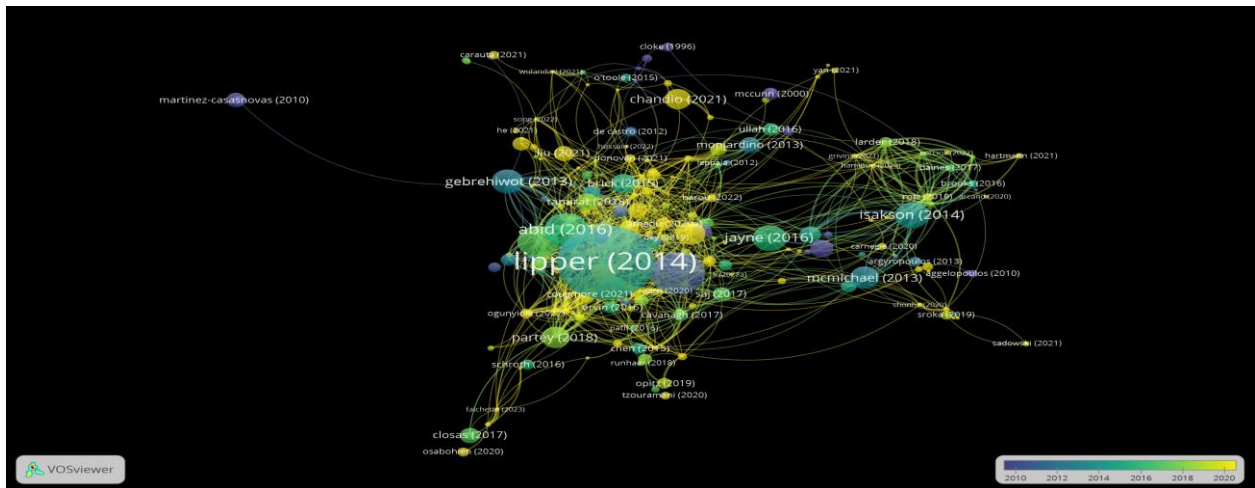


Figure-6: Bibliographic Coupling of documents

4.7 Bibliographic Coupling with Sources

The figure below shows that Bibliographic coupling with sources is the method of analyzing the relationship between the documents based on reference and citations the authors have shared. Journal of sustainability gives more output in the field agricultural financing in India.

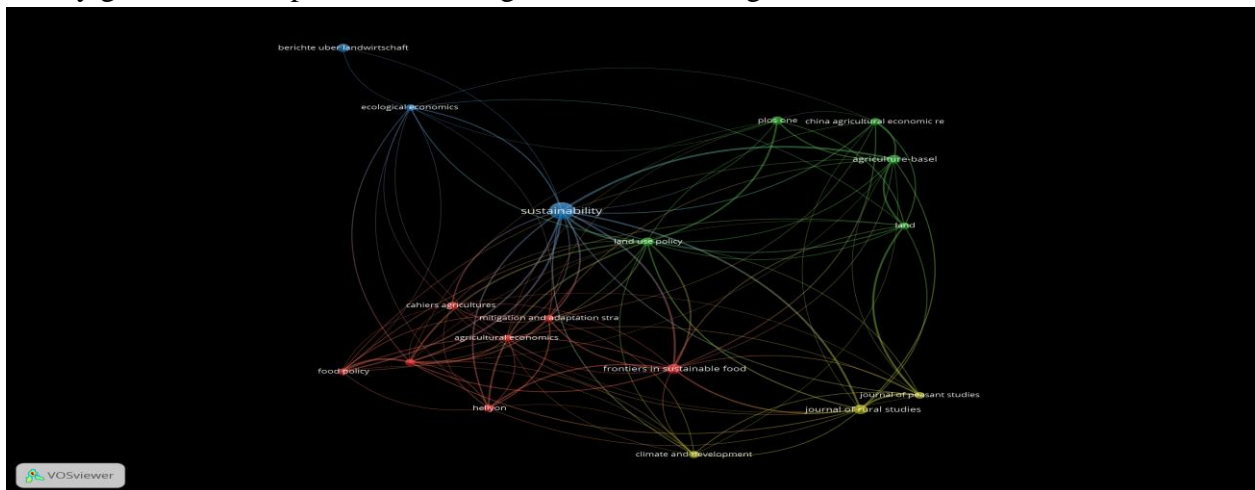


Figure-7: Bibliographic Coupling of sources

5. CONCLUSION

This bibliometric analysis of agricultural finance examines the evolving landscape of the topic in detail. terrain and patterns. Key problems and research goals in agricultural finance were identified through the examination of scholarly journals, citation trends, and keyword networks. The evaluation highlights the value of financial institutions, lending options, risk mitigation strategies, and legislative actions in fostering sustainable agricultural growth, raising productivity, and resolving the problems that farmers and rural communities face globally. The rise of innovative financial tools, digital platforms, and impact investing strategies reflects a shift towards more inclusive and technologically advanced methods of agricultural financing. The review emphasizes the significance of sharing information, collaborating across disciplines, and using evidence-based policymaking to enhance financial inclusion, resilience, and sustainability in agricultural systems. In addition to offering helpful direction for future research directions, interventions, and policy frameworks targeted at addressing agriculture's complex and dynamic financial needs in a rapidly evolving

global context, the results of this bibliometric analysis aid in understanding the current state of agricultural finance research.

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