



Islamic Modes for Agricultural Financing: Which is the Most Suitable?

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Abstract. The agricultural sector is a primary sector in a country, contributing to GDP, providing raw materials for industry, and ensuring food and nutritional security. Additionally, the agricultural sector often proves to be a stabilizing force for the national economy during economic crises. One financing model suitable for this sector is the sharia-compliant financing scheme. This study employs a bibliometric analysis to explore the extent of research on Islamic financing models for the agricultural sector, analyzing 41 Scopus-indexed journal articles. Six main themes emerge: conceptualizing Islamic agricultural financing, waqf technology for SDGs in agribusiness, risk management in Islamic agricultural credit, Islamic finance for agricultural projects, economic growth through Islamic agricultural finance, and Islamic Microfinance Institutions (IMFIs) in agricultural finance. The analysis identifies the most suitable Islamic financing modes as integrated *salam* contracts with IMFIs, Waqf Trustee-Anchor Company models for agribusiness on waqf land and crowdfunding models with *salam* contracts and *muzaraah* waqf. Additionally, *qard-al-hasan*, *muzaraah*, and aPLS (agricultural Production and Loss Sharing) scheme with *ujrah* principles are recommended for unproductive land development. Policymakers in the agricultural sector can leverage these findings to enhance the role of Islamic finance in fostering agricultural development, particularly in countries with a majority Muslim population.

Abstrak. Sektor pertanian merupakan sektor primer dalam suatu negara yang berkontribusi terhadap PDB, menyediakan bahan baku bagi industri, serta menjamin ketahanan pangan dan gizi. Selain itu, sektor pertanian kerap menjadi kekuatan penstabil bagi perekonomian nasional pada saat terjadi krisis ekonomi. Salah satu model pembiayaan yang sesuai untuk sektor ini adalah skema pembiayaan berbasis syariah. Penelitian ini menggunakan analisis bibliometrik untuk menelaah sejauh mana penelitian mengenai model pembiayaan syariah pada sektor pertanian telah berkembang, dengan menganalisis 41 artikel jurnal yang terindeks Scopus. Hasil analisis mengidentifikasi enam tema utama: konseptualisasi pembiayaan pertanian syariah, teknologi wakaf untuk SDGs dalam agribisnis, manajemen risiko dalam kredit pertanian syariah, pembiayaan syariah untuk proyek pertanian, pertumbuhan ekonomi melalui pembiayaan pertanian syariah, dan peran Lembaga Keuangan Mikro Syariah (LKMS) dalam pembiayaan pertanian. Dari hasil kajian, diperoleh model pembiayaan syariah yang paling relevan, yaitu integrasi akad *salam* dengan LKMS, model Perusahaan Inti-Nazhir Wakaf untuk agribisnis di atas tanah wakaf, serta model crowdfunding dengan kombinasi akad *salam* dan wakaf *muzara'ah*. Selain itu, skema *qard al-hasan*, *muzara'ah*, serta aPLS (agricultural Production and Loss Sharing) berbasis prinsip *ujrah* direkomendasikan untuk pengembangan lahan tidak produktif. Temuan ini diharapkan dapat dimanfaatkan oleh para pembuat kebijakan di

sektor pertanian guna memperkuat peran keuangan syariah dalam mendorong pembangunan pertanian, khususnya di negara-negara dengan mayoritas penduduk Muslim.

INTRODUCTION

The agricultural sector plays a crucial role in the economy, particularly in developing countries. Agriculture serves as the primary source of income, employment, and food security for a significant portion of the population. In many developing countries, agriculture is the main source of livelihood for the majority of their populations (Kanza and Vitale, 2015). For example, 65% of the people in Africa depend on agriculture as their primary source of income (Davis et al., 2017). In addition, the agricultural sector tends to be the primary source of employment in low- and middle-income countries (Cheong et al., 2013). Agriculture is also crucial for ensuring food security, as it provides the basic food needs for the population. In some cases, importing food products from other countries becomes necessary to maintain domestic food availability and stability (Mukhlis and Gürçam, 2022). It is play a significant role in poverty alleviation by providing employment and income opportunities. In some cases, agricultural productivity can also help reduce poverty by increasing food availability and lowering prices (Mukhlis and Gürçam, 2022).

Furthermore, in its contribution to the economy, it was explained that agriculture makes a significant contribution to GDP (Anwer et al., 2015; Chowhan et al., 2023; Van Arendonk, 2015). For instance, in many Third World countries, the agricultural sector determines the direction and success of the economy. Furthermore, agriculture, food, and related industries contribute approximately 5.6% to the United States' Gross Domestic Product (GDP), with American agricultural output contributing about 0.7% to the GDP (Kassel, 2023). In Ethiopia, agriculture contributes a substantial portion to GDP growth and generates the majority of export revenues (Admassie and Abebaw, 2021). In addition, in Malaysia, agriculture contributes 7.1% to the GDP and provides 10.5% of the country's employment opportunities (Sulaiman, 2023). Meanwhile, in Indonesia, the agricultural sector contributes approximately 13.28% to the Gross Domestic Product (GDP) based on current prices (Musyaffa, 2023).

Although agriculture makes a significant contribution to GDP, the sector still faces several challenges, particularly in terms of financing. This is because farmers encounter substantial risks due to unpredictable weather patterns, pests, and diseases, which can lead to crop failures and financial losses (Khan et al., 2024; Wulandari et al., 2017). Farmers also contend with market price fluctuations, which can reduce income and complicate access to credit (Khan et al., 2024; Balana et al., 2022). Furthermore, poor rural infrastructure, including limited storage facilities, inadequate transportation networks, and unreliable supply chains, hinder farmers' ability to access markets and sell their products (Khan et al., 2024; Kiros and Meshesha, 2022). Farmers often lack knowledge about loan products, interest rates, and application processes, which makes it difficult for them to access financial services (Wulandari et al., 2017; Kiros and Meshesha, 2022). Moreover, the limited access to agricultural extension services, which provide farmers with crucial information, training, and support, can hinder their ability to adopt modern farming practices and improve productivity. Financial institutions also frequently impose high interest rates and avoid risks, making it difficult for farmers to obtain credit and invest in their agriculture (Khan et al., 2024; Wulandari et al., 2017). These challenges can significantly impact farmers' ability to access credit, invest in their agriculture, and effectively manage risks, ultimately affecting their income and productivity.

Therefore, Islamic financial instruments can serve as an alternative financing option for the agricultural sector and play a significant role in agricultural financing by providing sharia-compliant alternatives compared to traditional interest-based financing methods. Several Islamic financing models that can be utilized in the agricultural sector include *murabahah*, which is a financing method where Islamic financial institutions (IFI) purchase goods or commodities from the market and sell them to farmers at a markup

price, thereby generating profit margin. This method can be used for purchasing agricultural equipment, machinery, and inputs such as seeds, fertilizers, and pesticides (Puspitasari et al., 2019).

Additionally, *mudarabah* is a partnership model where one party provides capital and the other provides expertise or labor. This model can be applied in agricultural financing by having farmers contribute labor while Islamic financial institutions (IFI) provide capital for inputs and equipment (Puspitasari et al., 2019; Kaleem and Wajid, 2019). This system offers flexibility in terms of risk sharing and profit distribution, making it a suitable choice for farmers looking to manage their risks effectively (Wulandari et al., 2017). Meanwhile, *ijarah* is a lease-based model where Islamic financial institutions (IFI) purchase assets and lease them to farmers. This model can be used for leasing agricultural equipment, machinery, and other assets (Puspitasari et al., 2019). This product offers flexibility in terms of lease duration and types of assets that can be leased, making it a suitable choice for farmers who wish to manage risks effectively and benefit from the use of modern equipment (Wulandari et al., 2017; Kambali and Panakaje, 2022).

Some relevant studies on this research topic include the application of financial technology in Islamic finance using a systematic bibliometric method (Altarturi et al., 2021). Other discuss about Islamic finance to enhance the welfare of farmers and food sustainability (Sifa et al., 2022). Furthermore, the other researchers has examined of literature related to Islamic agriculture and agribusiness financing (Aziz and Yusoff, 2013). Past study discussed about *qard-al-hasan* (interest-free loan) from the perspective of its potential application in agriculture with the aim of providing alternative financing sources free from interest for Muslim farmers in Islamic countries (Saqib et al., 2015). The development of fintech products and Islamic finance within the agricultural value chain (Ningrat and Nurzaman, 2019).

Moreover, the exploration of the application of *murabahah* contracts has been examined in the agricultural sector (Puspitasari et al., 2019). Meanwhile, the influence of non-performing finance, inflation, interest rates, Bank Indonesia Sharia Certificates, DPK (Deposit to GDP ratio), and the Industrial Production Index on financing in the agricultural sector at sharia banks has also revealed (Sudarsono et al., 2019). In addition, it has been proved that there is a role of Islamic banking in agricultural development (Hassan et al., 2012). The integrated financing models in Islamic microfinance institutions for the agricultural and fisheries sectors is needed (Anwar et al., 2019). Several studies have examined Islamic finance mode in supporting agricultural development, with most approaches being qualitative literature reviews and focused on specific regions. However, there has been no comprehensive bibliometric study on sharia financing models for the agricultural sector to date. This is what constitutes the originality of this study.

Therefore, this research aims to assess the extent of existing studies on sharia financing models for the agricultural sector using bibliometric analysis. Additionally, this study will identify which sharia financing schemes are considered most relevant and beneficial for the development of the agricultural sector. The anticipated benefits for farmers include improved access to financing, risk reduction, and increased productivity and welfare through adequate and sustainable financial support. For financial institutions, this research offers opportunities to diversify their portfolios, explore new markets in the agricultural sector, and enhance reputation and public trust by providing ethical and fair Islamic financial solutions.

Meanwhile, for policymakers, this research provides empirical foundations for developing policies that support agricultural financing through Islamic financial instruments, enhancing the effectiveness of government programs in supporting the agricultural sector and national food security. It also contributes to economic and social welfare by supporting sustainable and inclusive agricultural sectors. Thus, this research is expected to provide comprehensive understanding and tangible benefits to all relevant stakeholders involved.

LITERATURE REVIEW

The agricultural sector is the most important sector in many countries, with a majority of farmers being small-scale farmers who often struggle to access financing to develop their farming operations. This is why various efforts are needed because agriculture is vital as a fundamental human need to live and function. Financing for farming operations can come from various financial institutions, but small farmers, who are also local farmers, typically find it very difficult to access due to various constraints, especially the high risks associated with farming ventures, which are deemed challenging to repay loans from banks, primarily due to high interest rates on loans, lack of collateral, fear of difficult recovery processes, low profitability, and even unprofitability, as well as limited access to capital markets (Aitkazina, 2013; Elhiraika, 1996; Khan and Nomani, 2020; Shafiai and Moi, 2015), and there is a lack of investment support (Omodero and Ehikioya, 2022; Ozerova and Sharopatova, 2021). In addition, farmers desire interest-free financing for their agricultural products (Shaikh, 2024). Therefore, Islamic finance emerges as the best solution for agricultural financing (Khan and Nomani, 2020).

The vast potential of Islamic financial modes in supporting global food security in various countries with high agricultural potential has prompted researchers to delve deeper into and explore their practices for successful implementation. Several studies have examined their substantial potential in supporting the agricultural sector. Some agree that there are contracts that can be used to help solve financing issues in agriculture, such as the concept of *musharakah*, where the mode involves financing cooperation and is believed to be the best option for implementation in Pakistan (Saqib et al., 2014). However, further researchers have also proposed that there are other modes that can essentially be implemented to address financial issues in agriculture, such as *muzara'ah* (temporary sharecropping contract) and *musaqah* (Shafiai and Moi, 2015), and diminishing *musharakah* (*al-musharakah al-mutanaqisah*). Another sharia financial mode that is effectively utilized for developing the agricultural sector, particularly in local agricultural sub-sectors within rural areas, is *ijarah* (Saqib and Zafar, 2017).

Meanwhile, in other countries like Tanzania, there exists a prime cloves farming region called Zanzibar, which unfortunately faces significant challenges in developing its cloves agriculture industry. The government there is perceived to have failed in addressing these issues, prompting researchers to propose the implementation of Islamic finance modes in its agricultural value chain, specifically suggesting the waqf-*muzara'ah* model. The involvement of waqf in this Islamic finance mode is due to the presence of waqf assets such as land in Zanzibar that are underutilized, despite the high cost of their management. Additionally, waqf institutions there could fund clove farmers by providing working capital, paying intermediaries who collect cloves, purchasing drying mats for proper clove drying, ensuring that the cloves dry well and meet Grade A standards for sale at good market prices. Furthermore, collaboration with private institutions involves *muzara'ah* agreements where private institutions provide inputs for cloves and distribute them to clove processing industries, while farmers contribute their labor and expertise in farming and harvesting (Moh'd et al., 2017).

Similarly, agriculture in Nigeria faces critical investment needs (Omodero and Ehikioya, 2022) and waqf is considered as an alternative solution in agribusiness financing (Amudaa et al., 2019). Additionally, there is also the sharia financial mode of *salam-muzara'ah* linked waqf in agricultural sector financing, integrated with Islamic commercial finance. In this mode, the utilization of returns from cash waqf with idle waqf land as agricultural land is applied in *Baitul Maal wat Tamwil* (BMT) (Majid, 2021). This means that Islamic social financial instruments can be a solution for the development of the agricultural sector (Abduh, 2019; Mi'raj and Ulev, 2024). Waqf has proven to significantly contribute to socio-economic development (Alshater et al., 2022). The integration of Islamic social financial instruments with various sharia contracts across different Islamic financial institutions has the potential to be further developed to support the agricultural sector.

In India, the sugar industry has experienced hardship over the last decade, struggling to secure adequate funding for operations. This difficulty is compounded by banks' reluctance to lend to sugar farmers, prompting suggestions for Islamic finance modes within Islamic banking. Specifically, sharia-compliant financial instruments could be deployed through contracts such as *salam* and *murabahah* financing agreements tailored to the agricultural sector (Nomani and Azam, 2020). This aligns with the situation in Oman's agricultural sector, where *salam* financing is referred to as the best alternative financing option there (Ahmed and Fida, 2020) and also in Indonesia (Utama and Suwarsi, 2019). However, unfortunately, farmers in Turkey, despite being a predominantly Muslim country, still have a very low percentage of sharia-compliant bank users (Bulut and Celik, 2022). This is one of the other challenges faced in the agricultural sector. Alongside this, entering the digital era presents numerous potentials that can be leveraged to develop the agricultural sector.

One example of opportunities in the current digital era is the utilization of fintech in the agricultural sector (Mapanje et al., 2023). This is also the case in Islamic finance mode where fintech is also very potential to be developed, including Agriculture Value Chain Finance Islamic FinTech (AVCF-IF) which in this scheme the sub-sectors in the supply chain can be connected through digital platforms in building Islamic financial products including actors, suppliers, producers, and market intermediaries separated into 3 market segments namely: low-income market, middle/upper market, and international market. In essence, this scheme provides a mode of Islamic finance to help carry out various transactions in one platform (Ningrat and Nurzaman, 2019). Likewise, the agricultural sector in Pakistan has recently been introduced to supply chain fintech innovations, particularly those aimed at enhancing connections between middlemen (Maryam et al., 2023). Funding support for the agricultural value chain is critical (Miller and da Silva, 2007).

Financing the agricultural sector can also use sukuk schemes also have potential in developing the agricultural sector, especially in assisting food commodity trading activities (Kalimullina and Orlov, 2020). Meanwhile, related to environmental issues, there is an interesting scheme that is proposed as a development of sukuk, namely green sukuk, where green sukuk is one of the latest Islamic financial innovations that also prioritizes the good of all mankind in sustainable development. The results of existing research state that one of the priorities of financing projects with the green sukuk scheme is the agricultural sector (Rahman et al., 2024). This is in line with the findings of existing research where one of the most common financing projects received by the Islamic Development Bank (IDB) in Central Asian countries is agriculture (Daurenova et al., 2021). Innovation and sustainable financing for the agricultural sector is needed (Nkala, 2023). In the future, it is possible to integrate agricultural sector financing with blockchain technology (Zhang, 2020), including the integration of blockchain in the agricultural supply chain (Wang and You, 2022).

Therefore, the success of developing a financial system in the agricultural sector based on sharia contracts is needed to help the sustainability of farming businesses, landowners and even to alleviate poverty (Shafiai and Moi, 2015). Based on the existing literature, some studies focus on Islamic financial models for agriculture to assist small-scale farmers in rural areas. So far, the integration of zakat and waqf into Islamic microfinance has been implemented to ensure sustainable financing and enhance the stability of agricultural ventures. Several studies highlight innovations in Islamic financial models, such as *muzara'ah* (temporary sharecropping) and *salam* contracts. Recently, researchers have examined the potential of fintech and green sukuk, integrated with blockchain technology, to enhance the agricultural supply chain.

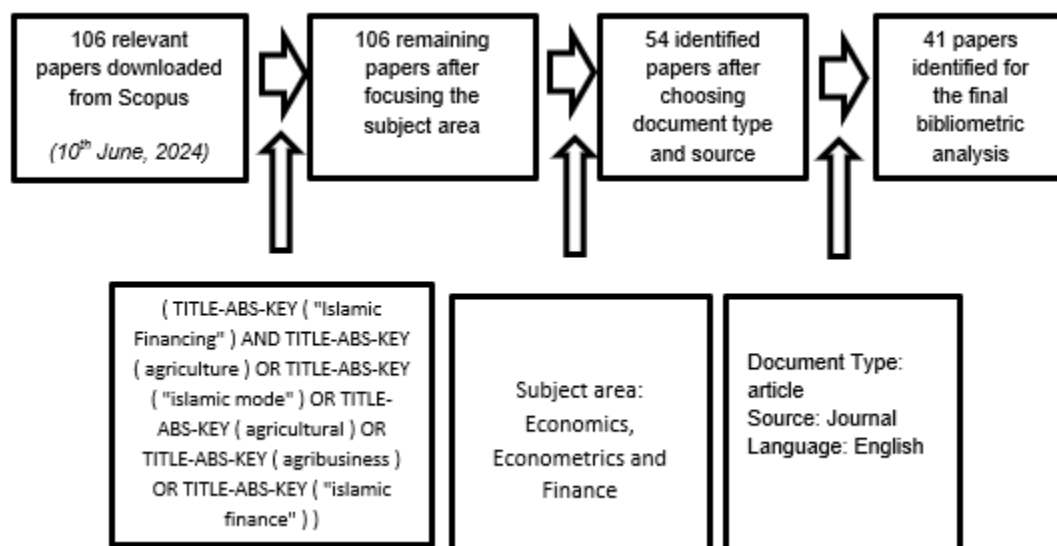
To date, there is no research that comprehensively examines the various modes of Islamic finance in the agricultural sector and discusses which mode is best implemented by searching Scopus indexed literature, which is why this research can contribute greatly to the agricultural sector where policy makers can increase their role in supporting the optimization and integration of various Islamic finance modes in

existing Islamic and commercial financial institutions effectively and efficiently in various countries, especially Muslim majority countries.

METHOD

This research utilizes a range of scientific journal publications worldwide on the theme "Islamic Financing for Agriculture" as data sources. Journal publications indexed in the Scopus database with the keyword "Islamic Financing", "Islamic mode", "Agriculture", serve as the data foundation that have published all years. Subsequently, relevant scientific articles or journals are selected from the collected publication data to align with the research theme. A total of 41 journal articles have been published on the theme "Islamic Financing for Agriculture." The development of publication trends related to this research topic was analyzed using VOSviewer software (Van Eck and Waltman, 2012; Van Eck and Waltman, 2010), which can generate bibliometric maps and allow for more detailed analysis (Alshater et al., 2022; Al Husaeni and Nandiyo, 2022; Bukar et al., 2023; Firdaus, 2021; Rusydiana et al., 2023).

The mapping technique utilized VOSviewer has been previously used to obtain bibliometric visualizations for analysis. VOSviewer can generate and display author journal maps using co-citation data or keyword maps based on co-occurrence data. In this study, journal maps related to Islamic Financing for Agriculture, including author and keyword maps, will be analyzed. These maps will help identify potential future research paths by examining clusters in keyword mapping. This study uses a descriptive qualitative approach, combining meta-analysis and a descriptive statistical review of 41 journal publications on Islamic Financing for Agriculture. Meta-analysis integrates previous research to evaluate existing findings (As-Salafiyah et al., 2021). The qualitative method, also called a constructive method, organizes data into a clear and meaningful theme. Article with majority discussion on "Islamic financing for agriculture" is used to gather in-depth review that meets the research goals (Sukmana, 2020). The filtering document can be seen in Figure 1.



Source: Authors, 2024.

Figure 1 Filtering process of document

RESULTS AND DISCUSSION

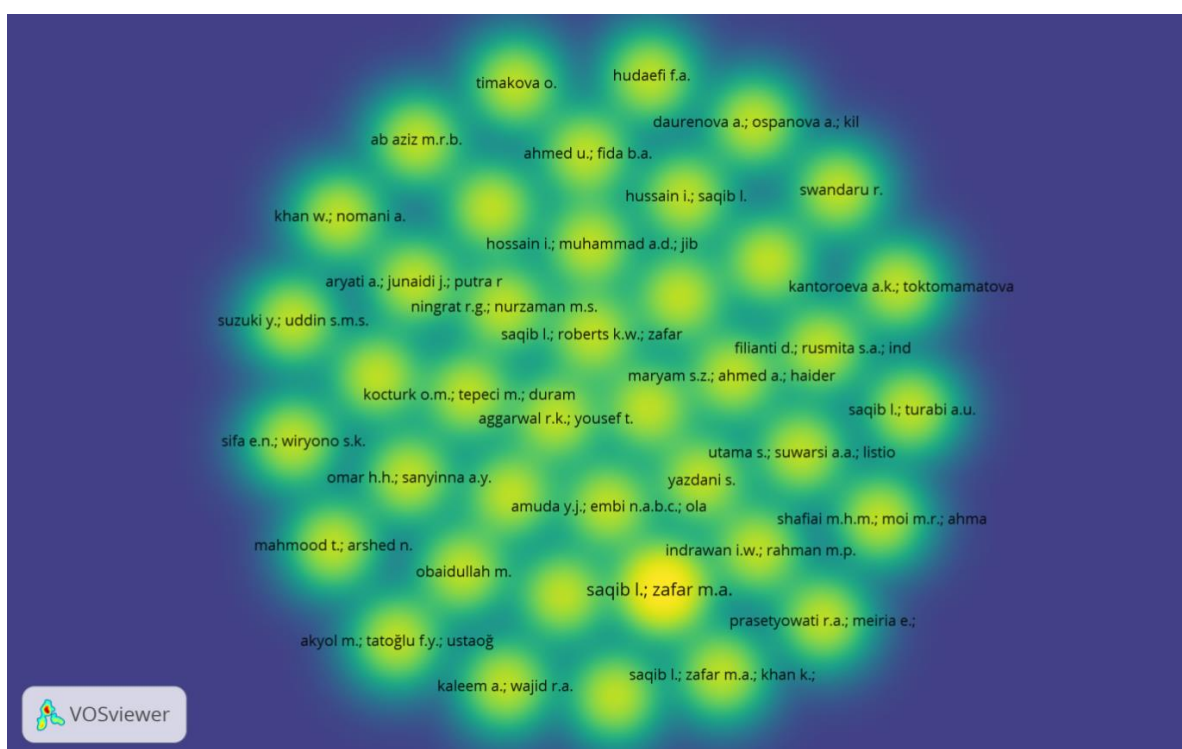
This research delves into "Islamic Financing for Agricultural" using 41 journal articles indexed in Scopus. Bibliometrics, a method for assessing scientific performance through factors like citations, patents, and

publications, is employed to evaluate research activities, laboratories, scientists, countries, and scientific specializations. Key steps in bibliometric analysis include defining research background, selecting relevant databases, and determining primary indicators.

This section aims to expand on meta-analysis findings with a visual mapping chart encompassing 64 journals related to "Islamic Financing for Agricultural." The mapping involves analyzing keywords and significant terms from journal articles to identify knowledge elements, configurations, dynamics, dependencies, and interactions among these elements. The network visualization results of the 41 journals focused on "Islamic Financing for Agricultural" will be elaborated further in the subsequent section.

Author Mapping Analysis

Through bibliometric analysis using VOSviewer software, a visual map of authors contributing to the field of "Islamic Financing for Agricultural" is generated. The map visually represents the authors based on the frequency of their journal publications related to the theme. Larger and brighter yellow points indicate authors who have published a higher number of journal articles on "Islamic Financing for Agricultural."



Source: Research finding by authors, 2024 (processed data).

Figure 2 Authors mapping analysis

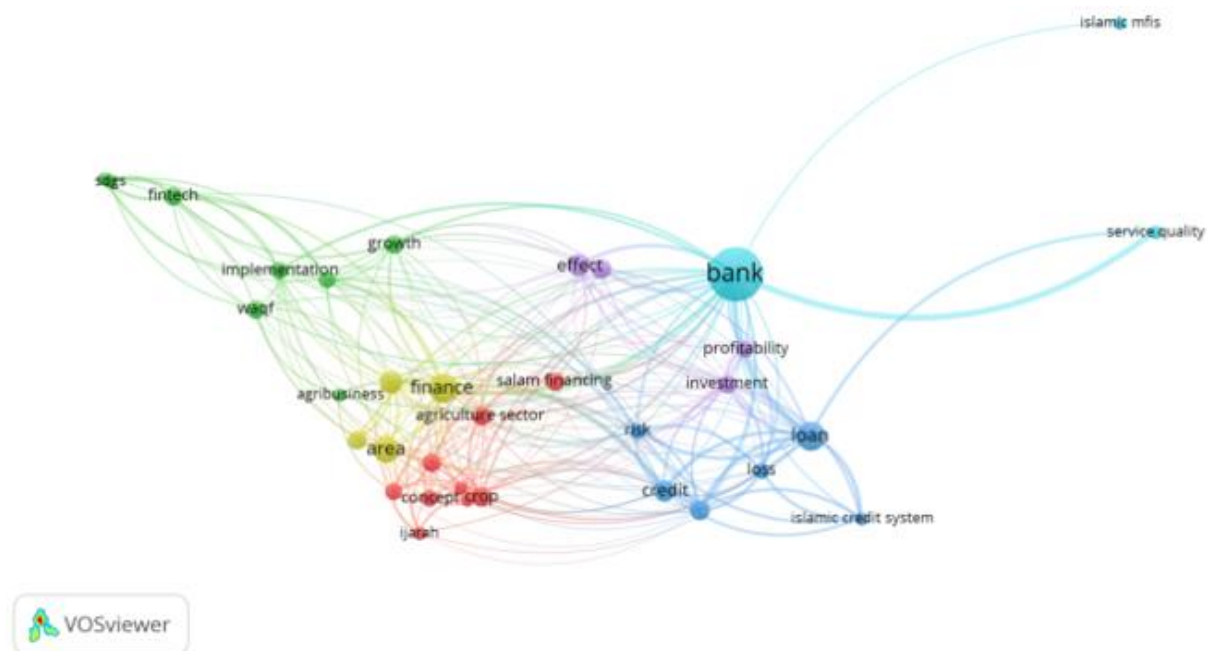
In Figure 2, it is illustrated that cluster density in the bibliometric map is indicated by the intensity of the yellow color. The shade of yellow on the map corresponds to the number of connections between items, underscoring the significance of this section for gaining an overview of the bibliometric map's overall structure and its analytical importance. This section enables the identification of authors who have contributed the most publications in the field.

Typically, each author or researcher exhibits varying patterns across their publications. Sometimes an author may publish solo, while other times they collaborate with fellow authors or researchers, influencing the density of clusters where certain clusters display differing densities. Authors with higher cluster densities indicate a greater volume of research output in the field of "Islamic Financing for Agricultural"

compared to those with lower densities. These findings can serve as a valuable reference for future researchers. Analysis results reveal that Saqib L. and Zafar M. A. are the most prolific authors in publications related to "Islamic Financing for Agricultural."

Research Mapping Analysis

Figure 3 describes the trend of keywords appearing in studies on the theme of "Islamic Financing for Agricultural," where larger forms represent the most frequently used words in journal publications on "Islamic Financing for Agricultural."



Source: Research finding by authors, 2024 (processed data).

Figure 3 Documents' mapping analysis

Regarding the keyword mapping in publications related to "Islamic Financing for Agricultural," prominent keywords include bank, finance, area, loan, effect, and credit. These keywords are categorized into 6 clusters, detailed as follows:

Table 1 Cluster analysis regarding the keyword mapping in publications related to "Islamic Financing for Agricultural"

Cluster	Keyword
Cluster 1 (9 items)	Agriculture sector, concept, crop, <i>ijarah</i> , Islam, Islamic banking instrument, non crop activity, <i>salam</i> financing, transaction
Cluster 2 (8 items)	Agribusiness, fintech, fintech firm, growth, implementation, SDGs, technology, waqf
Cluster 3 (6 items)	Credit, Islamic credit system, loan, loss, profit, risk
Cluster 4 (4 items)	Area, cooperation, finance, project
Cluster 5 (4 items)	Economic growth, effect, investment, profitability
Cluster 6 (3 items)	Bank, Islamic MFIs, service quality

Source: Research finding by authors, 2024 (processed data).

Cluster 1 : Conceptualizing Islamic Agricultural Financing

Research on this topic is still very rare, and this shows that there is still a research gap on this topic. One of the studies relevant to this topic includes the financing model of Islamic Microfinance Institutions (IMFIs) based on the characteristics of the agriculture and fisheries sectors and reconstructing the *salam* contract from Islamic financial institutions for farmers and fishermen. The uniqueness of micro, small, and medium enterprises (MSMEs) in the agriculture and fisheries sector has triggered thinking about innovation in microfinance institutions (MFIs) that serve them (Anwar et al., 2019). In various countries, service innovations in the agriculture and fisheries sectors have been implemented to foster their development.

Research findings indicate that the *salam* contract, tailored to fit the characteristics of fishing communities, aims to liberate them from the influence of moneylenders and large traders. This includes the involvement of Islamic Microfinance Institutions (IMFIs) where farmers and fishermen participate as members, buyers, Islamic banks, and providers of Islamic insurance. The study emphasizes the establishment of communities among farmers and fishermen to mutually support each other's financial needs, overseen by IMFIs working in collaboration with agricultural and fisheries enterprises. Additionally, the integration of the *salam* contract within Islamic finance is highlighted as a beneficial approach that enhances the welfare of farmers (Sifa and Wiryono, 2024).

Lesson learned

Based on these findings, this study propose the creation of a financing product by developing a customizable *salam* contract. This can help meet the specific needs of agricultural communities, such as introducing flexible repayment schedules that align with the harvest cycles of agricultural commodities. Additionally, this can mitigate various financial burdens faced by farmers.

Cluster 2 : Waqf Technology for SDGs in Agribusiness

On this topic, there are still few relevant studies found. Waqf land is one of the highest types of waqf property in Malaysia (Selangor and Perak) that have fertile land but different management authorities; however, it is still unable to reach its full potential due to various constraints such as capital, location, legal and administration (Azizan et al., 2022). This research confirms that while some improvements have been noted, the constraints and challenges identified in previous literature persist. Additionally, this study introduces new themes, focusing on securing markets for agribusiness products and exploring the potential role of anchor companies in agribusiness. To ensure the success of agribusiness ventures, it is crucial to carefully select anchor companies capable of overcoming these challenges.

The study proposes two models of anchor companies—Waqf Trustee-Anchor Company and Waqf Trustee-Anchor Company-Community Farmers—that can effectively be implemented in agribusiness ventures on waqf land. Moreover, an Islamic crowdfunding model for the agricultural sector based on *salam* and *muzara'ah*-waqf schemes (Al-Daihani et al., 2024). The research specifically examines modern and contemporary forms of temporary endowments and demonstrates some of their impacts in supporting the economy and communities in need. The research findings show that temporary waqf is an important means of providing renewable and sustainable economic support, whereby wealthy people donate their money for religious purposes and to help others in need.

Lesson learned

There are at least three important insights of these findings. First, the importance of public-private partnerships (PPPs) involving the government, private entities, and Islamic financial institutions can address legal and administrative barriers and provide comprehensive support in the development of waqf land, allowing it to be freely managed by farmers. Second, the presence of anchor company models acting

as intermediaries between small farmers and larger markets can ensure better market access and pricing for agribusiness products. Third, leveraging various crowdfunding platforms can attract investments in agribusiness projects and facilitate direct contributions from Muslim majority countries.

Cluster 3 : Risk Management in Islamic Agricultural Credit

One pertinent study has investigated how socio-economic factors influence the use of agricultural credit as a risk management strategy among farmers in Pakistan. Given that agricultural products constitute the primary income source in all farming activities, it is crucial for farmers to mitigate and effectively manage production risks. Agricultural credit plays a pivotal role in facilitating farm management processes. It is used worldwide, and particularly in Pakistan, as an ex-ante and ex-post risk management strategy by farmers (e Saqib et al., 2016). Moreover, agricultural credit has proven to enhance agricultural production (Chaiya et al., 2023; Yadav and Rao, 2024) where farmers utilize credit for land preparation, fertilizers, seeds, pesticides, and daily labor wages (Chaiya et al., 2023). Farmers who borrow experience higher returns on capital compared to those who do not borrow. Consequently, farmers become targets in the credit market, which can affect poor farmers negatively and disadvantage other farmers (Beaman et al., 2023). Therefore, Islamic agricultural credit is highly needed by farmers, especially poor farmers, as it can facilitate their needs in accordance with sharia principles.

Lesson learned

This study analyzes the need to develop an Islamic credit scoring model that assesses farmers' eligibility based on socio-economic conditions to ensure fair access to credit. Additionally, we evaluate the necessity of introducing insurance products that cover agricultural risks, providing farmers with security and peace of mind in the event of crop failures or unforeseen incidents. Continuous education and training for farmers to improve financial literacy and risk management are crucial, enabling them to effectively utilize sharia-compliant financing.

Cluster 4 : Islamic Finance for Agricultural Projects

Recent studies have examined *Qard-al-Hasan* (QH), a form of benevolent loan, regarding its potential application in agriculture to expand the availability of interest-free financing for Muslim farmers in Islamic countries like Pakistan. Findings indicate that interest-free financing is crucial for impoverished Muslim farmers who adhering to the prohibition of *riba* (interest), cannot rely on conventional financial arrangements. The research demonstrates that QH represents a feasible solution to meet this demand, benefiting both farmers and Islamic banks or financial institutions (Saqib et al., 2015).

Moreover, Islamic banking and finance has the possibility as agricultural investment in the Republic of Serbia (Kačar et al., 2017). Financing the economy and agriculture also in the Republic of Serbia in the past has been realized and have been implemented with financial support and credit from the state, as well as through commercial bank loans and expensive financial leases. Given the productive resources, the importance of agriculture for the national economy and employment of the population, and that the financing of agriculture in the Republic of Serbia, at the current level of development, should be implemented with state support. The results of this study suggest that Islamic banks can provide favorable financing options for agriculture in Serbia without the use of interest rates, which is in line with Islamic beliefs. This may lead to potential business relationships and cooperation with other institutions based on Islamic principles.

In addition, the use of profit-sharing "*muzarah*" and irrigation "*musagah*" as partnership methods for financing agricultural sector and microfinance projects by Islamic banks has been discussed (Omar, 2020). The researcher also explored the terms of these contracts and their implementation in the Islamic banking system, and his findings showed that these contracts have certain conditions and can be valid or invalid.

The conclusion of the study explains a number of things, namely that crops sharing is a permissible contract in the Hanbali Mazhab and in the views of Abu Yousuf and Mohammed bn Al-Hassan Alshybaini. Then, for the validity of crop sharing, the conditions: The land to be cultivated, the seeds, the labor, the profit and the term of the contract must be specified. Furthermore, profit sharing can be valid or invalid, *musagah* or irrigation contracts are formed through offer and acceptance, irrigation contracts are the delivery of trees to workers for irrigation or harvesting purposes. Furthermore, *musagah* and *muzarah* contracts have the same conditions. Finally, both contracts have the same reasons for nullity or invalidity. As a result, Islamic finance is an alternative method of agricultural financing (Khan and Nomani, 2020).

Other relevant studies that examining the application of Islamic banking instruments (*bai salam*) for agricultural financing in Pakistan was conducted by Kaleem and Wajid (2009). Additionally, the construction of a proposed model of Islamic financing mechanisms for the Islamic banking system for the agricultural sector and small and medium enterprises (SMEs) was conducted by Jazil (2019). Furthermore, there is a development of fintech in Islamic finance products for supporting agricultural value chain (Ningrat and Nurzaman, 2019). Previous study also analyzed factors affecting financing in Islamic banks in the agricultural sector (Sudarsono et al., 2019). In the context of Islamic business model, it can support agricultural value chain financing (Muttaqin et al., 2023).

Lesson learned

This study analyzes that interest-free loan programs, such as *Qard-al-Hasan* (QH), should be maintained and expanded across various Islamic financial institutions, particularly for small farmers who are unable to access financing services. Furthermore, partnerships involving profit-sharing between farmers and Islamic banks can provide numerous benefits and contribute to sustainable agriculture. In the context of inter-regional cooperation, support from various partnerships, including between Islamic financial institutions, is necessary to develop innovative Islamic financial products for the agricultural sector. Additionally, it is feasible to combine different contracts to meet the specific needs of farmers.

Cluster 5 : Economic Growth through Islamic Agricultural Finance

In proposing of Islamic model, based on the concept of *muzara'ah*, it can support the agricultural sector and overcome the limitations of current financing options. The tremendous growth of Islamic banking has turned a relatively new industry into a robust and widespread reality on the ground. Several Islamic Financial Institutions (IFIs) operate in different countries of the world and several modes of Islamic financing have been developed; however, most cater to the needs of commercial businesses and personal finance. Only a few IFI products are available to support the agricultural sector. One of the lesser used products is *salam* (a type of sale where farmers sell their produce in advance, before the harvest season, to obtain funds for their agricultural purposes as well as their livelihood costs), but its use is limited due to a series of limitations.

This research discusses the need for a shariah-compliant and participatory way of financing, and presents a model that can be implemented in the Islamic banking industry. It also includes a review of the concept of *muzara'ah*, a survey of agriculture in Pakistan, and recommendations for implementing the proposed model (Bangash, 2020). However, in the most current research, the *salam* scheme generates higher income, which can help enhance farmer welfare (Sifa and Wiryono, 2024). Additionally, the Islamic scheme requires fewer adjustments than the standard scheme to meet the needs of farmers.

Lesson learned

This study recognizes the need to develop Islamic financial products that cater not only to agriculture in general but also to the specific characteristics of various agricultural commodities. This entails designing contracts that are both appealing and effective in supporting the agricultural sector's success. Additionally,

it is important to sustain participatory financing models like *muzara'ah*, as they enhance collaboration between farmers and their partners, thereby promoting greater financial engagement and inclusion. Moreover, integrating modern financial techniques with *salam* contracts can ensure they are compatible with current agricultural practices.

Cluster 6 : Islamic MFIs in Agricultural Finance

The capital structure for Islamic microfinance institutions is crucial to alleviate poverty through agricultural financing (Shafiai and Moi, 2015). Islamic microfinance can be a solution to reduce poverty among rural farmers, but an appropriate capital structure is needed for Islamic Microfinance Institutions (IMFIs) to be able to finance the agricultural sector. Therefore, the objectives were set to find Islamic contracts that can be used for agricultural financing and to implement more feasible contracts in the capital structure of IMFIs to get the best solution for agricultural financing. The results stated that the IMFIs can obtain funds from zakat and waqf organizations that can be used for very poor farmers who cannot return the funds in case of losses. Funds obtained from government, client savings will be based on the *mudarabah* principle. On the other hand, *muzara'ah* contracts will be used by farmers and IMFIs as a means of financing for farmers. It concludes, IMFIs can provide the best solution to the problem of farmers not being able to meet farming costs by introducing *mudarabah* contracts on the supply side and *muzara'ah* on the demand side.

The formulation of a strengthening model from the institutional aspect through local farmer groups and strengthening capital through mediation between Islamic Financial Institutions through a linkage program was conducted by Roessali et al. (2019). In the case of Indonesia, the agricultural sector is a sector that has a strategic role in economic development. However, the agricultural sector has several problems such as the lack of guaranteed welfare of farmers, low access to capital and marketing of crops. The existence of farmer groups and Islamic Microfinance Institutions (IMFIs) has not been able to optimize the potential of the agricultural sector. Moreover, the lives of farmers in Malaysia and their problems in developing unproductive agricultural land.

The results found that the proposed aPLS (agricultural Production and Loss Sharing) scheme cannot stand alone in traditional fiqh to be implemented at present (Hakimi and Ajeerah, 2013). Therefore, a combination of the aPLS contract with the *ujrah* principle is absolutely necessary. This is important to ensure contractual flexibility that can offer a fully comprehensive Islamic agricultural financing scheme. This research concludes that land along with labor can be considered a form of capital and therefore has similarities with *mudaraba* and *musharaka* contracts. Therefore, it can be said that these principles are "agricultural production and loss sharing (aPLS)" as the land will naturally produce an output or product. *Muzara'ah* and *musaqah* can therefore be said to be contracts based on output sharing rather than profit sharing.

Lesson learned

Several points can be critiqued in the findings from this cluster, particularly regarding the need for integrating zakat and waqf within Islamic Microfinance Institutions (IMFIs). Such a financing model can ensure a sustainable source of capital, which is crucial for funding agricultural projects. Additionally, it is necessary to develop innovative capital structuring techniques that align with sharia principles to ensure the stability and resilience of IMFIs. Equally important is the need to establish community-based IMFIs that focus on empowering farming groups. This approach will enhance self-sufficiency and foster collaboration among rural communities.

Implications for Policymakers

Policymakers, particularly in Muslim majority countries, should prioritize Islamic financial models that integrate zakat and waqf within Islamic Microfinance Institutions (IMFIs) to support the sustainability of agricultural capital and enhance stability in rural agricultural enterprises. Additionally, there should be promotion of participatory financing models, such as *muzara'ah*, to improve financial inclusion. Efforts to establish community-based IMFIs are crucial for boosting self-sufficiency and cooperation in rural areas. Equally important is facilitating the adoption of innovative capital structuring techniques that align with sharia principles to enhance the effectiveness of Islamic microfinance. Cross-sector partnerships between government, private entities, and Islamic financial institutions, including Islamic banks, zakat and waqf institutions, and other Islamic philanthropic organizations, can further advance financial mechanisms in the agricultural sector.

Implications for Islamic Financial Institutions

Islamic financial institutions should concentrate on developing customizable financial products tailored to the unique characteristics of agricultural commodities, including adapting *salam* contracts to align with specific farming practices. Establishing participatory financing models such as *muzara'ah* can enhance relationships between farmers and Islamic financial institutions, while also improving financial inclusion. Additionally, Islamic financial institutions should innovate in capital structuring methods that comply with sharia principles to ensure stability and effectiveness in agricultural ventures. Collaboration with various stakeholders, including government, private sector entities, and other institutions, is essential to facilitate access to sharia-compliant financing for farmers, thereby ensuring the sustainability of agricultural enterprises and supporting sustainable development.

Implications for Society

Enhancing general social welfare in rural areas can be achieved by integrating zakat and waqf into Islamic microfinance through sustainable agricultural financing. This approach not only improves living standards but also reduces poverty. Strengthening *muzara'ah* contracts and establishing community-based Islamic microfinance institutions empower local farming groups, thereby increasing self-sufficiency. These measures contribute to greater economic stability and sustainable development in rural communities.

CONCLUSION

This study illustrates the extent to which various Islamic financing models for the agricultural sector have been studied using a bibliometric analysis approach. A total of 41 Scopus indexed journal articles have been analyzed and there are 6 main themes of the existing research, namely: conceptualizing Islamic agricultural financing, waqf technology for SDGs in agribusiness, risk management in Islamic agricultural credit, Islamic finance for agricultural projects, economics growth through Islamic agricultural finance, and Islamic Microfinance Institutions (IMFIs) in agricultural finance.

Based on a comprehensive analysis of the six clusters, the most suitable Islamic financing modes for the agricultural sector are integrated *salam* contracts with IMFIs, Waqf Trustee-Anchor Company and Waqf Trustee-Anchor Company-Community Farmers which can be implemented for agribusiness on waqf land, while crowdfunding models with *salam* contracts and *muzara'ah* waqf can be applied to support the development of the agricultural sector. Furthermore, *Qard-al-Hasan* to help increase the sources of usury-free agricultural financing, *muzara'ah* (temporary sharecropping contract) and aPLS (agricultural production and loss sharing) scheme with *ujrah* principle to develop unproductive agricultural land. Therefore, in the future, policymakers, especially in the agricultural sector, can apply the various existing

Islamic financing modes to maximize the role of Islamic finance in developing the agricultural sector, which is one of the vital sectors in various countries, especially in countries with a majority Muslim population.

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