

Global Research Trends on Coffee Marketing Systems: A Bibliometric Analysis Using the Scopus Database

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Abstract: Indonesia's coffee marketing system, which is largely dominated by smallholder farms, results in farmers receiving only a small share of the final selling value due to the lengthy distribution chain. Improvements through cooperatives, certification, and product diversification can enhance farmer welfare and strengthen the competitiveness of Indonesian coffee in the global market. This study aims to identify the constraints faced by farmers within the distribution chain, evaluate their access to more profitable markets, and propose strategies for improvement, including strengthening cooperatives, implementing certification, and diversifying products, in order to increase farmer income and global competitiveness. The research employs a bibliometric mapping analysis of coffee marketing trends over the past two decades. Data were collected from the Scopus database (<https://www.scopus.com>), which is recognized as one of the most comprehensive and reliable sources of scientific information. The analysis was carried out by utilizing the literature retrieved from Scopus, chosen for its broad and multidisciplinary coverage. The findings highlight the significance of technological innovation, sustainability, and global collaboration in improving coffee marketing systems, particularly in producing countries such as Indonesia. Strategies such as direct marketing, the adoption of digital technologies, and environmentally friendly practices like agroforestry emerge as key solutions to address market challenges and enhance farmer welfare.

Keywords: *Coffee Marketing Systems; Bibliometric Analysis; Global Research Trends*

1. Introduction

The coffee marketing system in Indonesia has a significant impact on farmer welfare, particularly in the context of the global coffee market. As the world's fourth-largest coffee producer, after Brazil, Vietnam, and Colombia, Indonesia produced approximately 795 thousand tons of coffee in 2021, with 94.5% originating from smallholder plantations (Wisnubroto, 2022). However, most Indonesian coffee is exported as a low value-added commodity, resulting in farmers receiving only a small share of the final selling price. This situation is largely due to lengthy distribution chains and farmers' limited access to more profitable international markets (Tamirat & Tadele, 2024). To improve farmer welfare, enhancements in the coffee marketing system are required, including strengthening the role of cooperatives, improving access to market information, and implementing certifications such as Fair Trade or organic (Rombeallo et al., 2024; Sudarko et al., 2020). These measures can help farmers obtain fairer prices and increase the competitiveness of Indonesian coffee in global markets. Furthermore,

product diversification through the development of specialty coffee offers new opportunities for farmers to improve their income (Noerhatini et al., 2022). Thus, improving the coffee marketing system will not only enhance farmer welfare but also strengthen Indonesia's position in the global coffee industry.

This system involves multiple stakeholders, including coffee farmers, cooperatives, middlemen, and exporters (Akinpelu et al., 2021). At the farmer level, coffee is often sold in the form of raw beans or coffee parchment to local traders or cooperatives (Pakkanna et al., 2022). The price received by farmers is frequently influenced by the quality of the beans, harvest season, and fluctuations in global market prices. Cooperatives often act as intermediaries that help farmers obtain better prices by pooling harvests (Kushenda & Hariasi, 2024). In the domestic market, coffee is distributed through two main channels: traditional markets and modern markets. Traditional markets involve local traders and consumers who purchase small quantities of coffee for daily needs (Indarti, 2023; Agustin et al., 2023; Noer et al., 2020). Meanwhile, modern markets, such as supermarkets, coffee shops, and e-commerce platforms, offer a wide variety of packaged coffee products, often with added value such as organic or single-origin coffee. The demand for premium and specialty coffee continues to rise, particularly among younger generations and urban communities (Raplant, 2021). The coffee marketing system in Indonesia has a major impact on farmer welfare, as coffee is one of the main commodities for many smallholder farmers. The long marketing chain, involving multiple intermediaries such as middlemen, wholesalers, and exporters, often results in coffee prices received by farmers being significantly lower than final consumer prices (Galmin et al., 2024; Cruz et al., 2023; Widiastuti, 2021). Research indicates that farmers on average receive only about 20–30% of the consumer-level price, while most of the profits are captured by downstream actors in the marketing chain. This situation has been identified as one of the main factors behind the slow improvement in the welfare of Indonesian coffee farmers (Lumbanraja et al., 2023).

Fluctuations in global coffee prices are also a crucial factor influencing farmers' income. Coffee prices are often determined by supply and demand dynamics in international markets as well as currency exchange rates. This price instability makes farmers' income uncertain, particularly for those who are not part of cooperatives or farmer organizations (Muñoz et al., 2023; Banowati et al., 2023; Soares et al., 2022). In addition, many farmers lack access to up-to-date market information, which leads them to sell their harvests at low prices to middlemen who dominate local markets. The presence of farmer cooperatives and direct trade models has been proven to generate positive impacts on the welfare of coffee farmers (Darma & Salman, 2023; Sayekti & Prihandono, 2023). Through cooperatives, farmers can collectively sell coffee at more competitive prices. Cooperatives also frequently provide training on sustainable farming practices, which enhances the quality of coffee and increases its market value (Aung Moon et al., 2022; Linda et al., 2023). Moreover, the direct trade model enables farmers to sell their coffee directly to buyers, such as roasteries or coffee shops, offering fairer prices by eliminating intermediary roles (Silva et al., 2022).

The coffee marketing system at the international level is more complex, involving certification, processing, and packaging processes that meet export standards. Indonesia's coffee exports are dominated by robusta and arabica varieties, each with its own market (Novtahaning et al., 2022). The main export destinations for Indonesian coffee include the United States, Europe, and Asia. To enhance competitiveness, exporters often collaborate with farmers through training programs aimed at improving the quality of coffee beans. In addition, the presence of exporter cooperatives helps expand farmers' access to global markets (Gullotta et al., 2023). However, Indonesia's

coffee marketing system still faces several challenges. Coffee prices at the farmer level are often unstable, depending on global market demand and the lengthy distribution chain. Furthermore, the lack of education on post-harvest processing among farmers results in lower-quality coffee beans (Thao et al., 2022). The government and related stakeholders need to continue encouraging efforts to improve the coffee marketing system through extension programs, access to financing, and strengthening cooperatives, so that Indonesian coffee can compete in international markets while simultaneously improving the welfare of local farmers (Vilchez-Mendoza et al., 2022).

One of the main problems in coffee marketing in Indonesia is the long and complex distribution chain, which creates a significant price disparity between farmers and end consumers. Research indicates that the existence of market power within coffee marketing channels influences marketing patterns in each major production center, leading to weak bargaining positions for farmers. As a result, they receive lower prices compared to prevailing market values (Rosiana, 2020). In addition, the quality of Indonesian coffee products often faces challenges in meeting international standards. One of the key trade barriers for Indonesian coffee exports is contamination with Ochratoxin A (OTA) fungi and pesticide residues such as Carbaryl. The presence of these contaminants can undermine international consumer confidence in Indonesian coffee and hinder exports (Simorangkir & Rosiana, 2022). Another challenge is the fluctuation of global coffee prices, which directly affects farmers' income. According to data from the International Coffee Organization (ICO), coffee prices tend to peak until October, when most coffee-producing regions deliver their harvests to the world market (Tamirat & Tadele, 2024; Ichinose et al., 2020; Peroff et al., 2021). However, this price instability makes it difficult for farmers to plan production and marketing strategies effectively (Wulandari & Djufry, 2022).

Coffee market behavior in Indonesia is influenced by several factors, including consumption patterns, relationships between farmers and traders, and a market structure that tends to be oligopsonistic. In this situation, traders or middlemen possess greater market power as they are often the only intermediaries linking farmers to broader markets (Barzola Iza & Dentoni, 2020). Consequently, the prices received by farmers are often low and disproportionate compared to consumer-level prices. This condition makes coffee market behavior asymmetrical, with profits tending to concentrate in the hands of traders and large distributors. The payment systems used by traders when purchasing coffee from farmers are also diverse. Most transactions are carried out in cash at the point of purchase, particularly among local traders or middlemen who buy in small quantities (Thuy et al., 2020; Rosas-Martínez & Aguilar-Rivera, 2022; Khathir et al., 2024). However, there are also partial payment or credit practices, in which traders provide an advance payment during harvest and settle the remaining amount after the coffee is sold in the market. This system often becomes problematic for farmers, especially when traders delay payments or fail to pay the full agreed amount. Such practices create an unhealthy economic dependency between farmers and traders (Muñoz et al., 2020).

Cooperation between farmers and traders is often based on long-term relationships built on trust and economic necessity. Some farmers prefer to sell coffee to specific traders they are familiar with, as this provides a sense of security and market assurance (Kurniati & Trison, 2023). On the other hand, traders frequently provide capital or loans to farmers before the harvest season to support production needs (Arslan et al., 2024). However, such cooperation is not always beneficial for farmers, as the capital or loans typically must be repaid with relatively high interest, or farmers are required to sell their harvests at prices predetermined by traders (Ochago et al., 2024). To address these

challenges, coffee farmer cooperatives have begun to play an important role in creating fairer systems of payment and cooperation. Through cooperatives, farmers can sell coffee collectively, thereby strengthening their bargaining position with traders or exporters. Cooperatives also usually offer direct cash payments once the harvest is received and provide training and funding facilities with lighter conditions compared to middlemen. In this way, the payment system and cooperative relationships between farmers and traders can become more mutually beneficial.

2. Method

The method employed in this study is a research trend analysis approach focusing on coffee marketing over the past 20 years, applying bibliometric mapping techniques (Chmielewski et al., 2017). This study specifically examines publications published between 2004 and 2024 to capture significant developments in research methodologies and bibliometric analytical tools that began to emerge during this period. The timeframe was also chosen due to the consistent growth and comprehensive coverage offered by the Scopus database, which serves as the primary data source for this research. Bibliometric analysis was selected as the main method because of its reliable capability to explore and analyze large volumes of scientific data related to a particular topic (Kustija et al., 2019). This statistical approach enables the identification of trends, patterns, and relationships among various studies, thereby providing a comprehensive understanding of the development of research in this field (Sayekti & Prihandono, 2023). Through this approach, the study aims to offer a clear overview of the dynamics and directions of coffee marketing research over the past two decades, which may serve as a foundation for further studies in this area.

This study did not require ethical approval because it did not involve human participation or direct interaction with research subjects. The primary focus of the study is the comprehensive and quantitative bibliometric analysis aimed at mapping trends and developments related to the topic “Coffee Marketing Systems and Their Impact on Farmer Welfare.” Therefore, ethical considerations concerning the treatment of human subjects are not relevant in this research context. In this bibliometric study, the analysis was conducted on various metrics reflecting the dynamics of publications in the field. The metrics analyzed include the annual number of publications, source titles, authors, institutions, countries, and keywords relevant to the topic “Coffee Marketing Systems and Their Impact on Farmer Welfare.” The data consist of primary, secondary, and tertiary journals published over a period of more than 20 years. This metric-based analysis was carried out to identify research trends, the level of academic productivity, and the contributions of institutions and countries to the development of this topic. By collecting data from diverse sources, the study aims to provide in-depth insights into the dynamics of publication in the field of coffee marketing systems and their implications for farmer welfare. The findings of this study are expected to support researchers, policymakers, and other stakeholders in understanding the key aspects influencing coffee marketing systems while also encouraging the development of more effective marketing strategies to improve farmer welfare.

2.1. Data Collection

Data analysis was conducted using literature obtained from the Scopus database, selected for its broad and comprehensive multidisciplinary coverage (Novtahaning et al., 2022). By employing keywords such as “System, Marketing, Coffee, Welfare, Farmers,” the researchers were able to identify patterns, trends, and relevant findings across various studies. The data collected from Scopus were then analyzed to reveal the relationship between coffee marketing systems and farmer welfare. The analysis process

included classifying the literature based on main themes, evaluating research quality, and comparing findings to gain a broader understanding of the context and implications. The strength of Scopus in providing access to diverse literature enabled the researchers to obtain deeper and more comprehensive insights into the research topic.

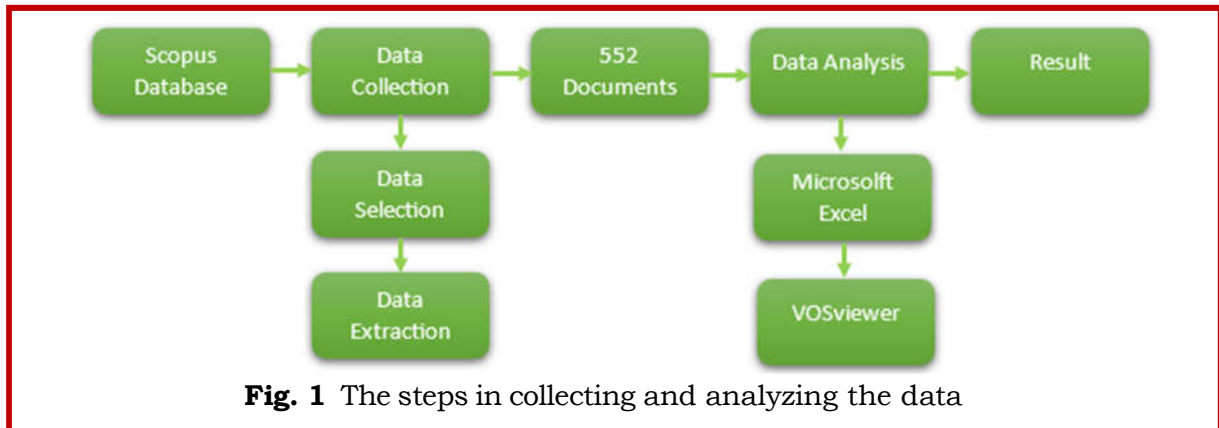
Electronic search and retrieval of data were conducted with the aim of identifying relevant articles for bibliometric analysis. To ensure a high level of relevance to the research topic, keyword searches were performed by including titles, abstracts, and keywords within the Scopus database. The search string combination used was TITLE-ABS-KEY ("Thought-experiments" AND "Science" OR "Physics"). The use of quotation marks around these phrases ensured that only documents containing the exact phrase were included in the search results, thereby improving the accuracy and relevance of the retrieved data. Furthermore, to narrow down the results and ensure that the analyzed articles remained both relevant and up-to-date, the publication year was restricted to studies published within the last 20 years (2004–2024). After applying a rigorous screening process to exclude papers that did not meet the inclusion and exclusion criteria, a total of 578 articles were identified for bibliometric analysis, of which 552 were journal articles.

2.2. Data Analysis

This study emphasizes several key bibliometric indicators, including the most productive publishers, the most cited articles, the most prolific authors, the most productive countries, and the evolution of author keywords over time. These indicators are essential for understanding how the body of knowledge on coffee marketing systems has been shaped and disseminated globally. By focusing on productivity and citation metrics, the study highlights not only the individuals and institutions contributing most significantly to the field but also the themes and research areas that have attracted the greatest scholarly attention. Tracking the emergence of keywords further illustrates how the focus of research has shifted across two decades, reflecting changing priorities such as sustainability, farmer welfare, or global market integration. In addition, co-authorship and co-occurrence analyses were applied to explore deeper patterns of scholarly collaboration and thematic connections. Co-authorship analysis provided a detailed picture of how authors interact and form research networks, offering insights into the extent of interdisciplinary and international collaboration. The same approach was extended to country-level metrics, with attribution given to all countries represented by co-authors in each publication. This inclusive method ensured that research contributions were more accurately reflected, capturing the global distribution of knowledge production. As a result, the analysis presents a comprehensive and fairer representation of how different countries, institutions, and researchers collectively advance the study of coffee marketing systems.

The data analysis shows that collaboration among authors, highly cited articles, and the temporal patterns of keyword occurrence provide important insights into the development of research related to coffee marketing systems and their impact on farmer welfare. The most productive publishers and authors play a crucial role in facilitating global discussions on challenges in coffee marketing, such as long supply chains, dependence on global markets, and price fluctuations. Co-authorship analysis reveals networks of collaboration across countries, which strengthen the understanding of both local and global marketing strategies. Furthermore, the distribution of research contributions across countries helps identify regions with a strong focus on empowering coffee farmers through fair marketing systems. Keyword trends such as “System,

Marketing, Farmers, Coffee, Welfare” emerging over time reflect the growing attention to how more inclusive marketing systems can influence the economic and social welfare of farmers. Thus, this study provides a strong foundation for the development of policies that support sustainable and equitable coffee marketing practices.



The figure illustrates the flow of bibliometric research, beginning with data collection and ending with analysis and conclusions. The process starts with retrieving data from the Scopus database, one of the primary sources for scientific publications. The data are then filtered according to specific criteria and extracted, resulting in a dataset of 552 documents. These documents were analyzed using tools such as Microsoft Excel for preliminary processing and VOSviewer for bibliometric visualization. The final output of this process consists of findings that are relevant to answering the research questions or identifying major trends. When linked to keyword trends such as “System, Marketing, Farmers, Coffee, Welfare,” this research flow helps explain how these terms have emerged in the academic literature. Through bibliometric analysis, keywords can be examined based on frequency of occurrence, co-word relationships, and the evolution of trends over time. For example, the link between “farmers” and “welfare” can be used to evaluate the impact of coffee marketing systems on farmers’ livelihoods. VOSviewer is able to visualize these connections in the form of keyword networks, offering deeper insights into the key issues under investigation.

3. Results and Discussion

3.1. Results

Statistical Analysis

This analysis employed statistical data to observe the annual differences in the number of published articles. The objective was to determine whether the number of publications on the topic of coffee marketing increased or decreased over time. The growth began in 2006 and continued until 2008, after which the number of published papers fluctuated between 2007 and 2018. The upward trend resumed in 2017 and continued through 2023. A significant increase was recorded in 2024, with 69 articles published. This growth indicates that research and publications on coffee marketing have gained substantial global attention over the last eight years, despite the noted decline in 2024. Although studies in this field are still ongoing, these findings highlight the annual growth in coffee marketing scholarship and publications indexed in Scopus.

Table 1. Trends in the Number of Published Articles on Coffee Marketing (2004–2024)

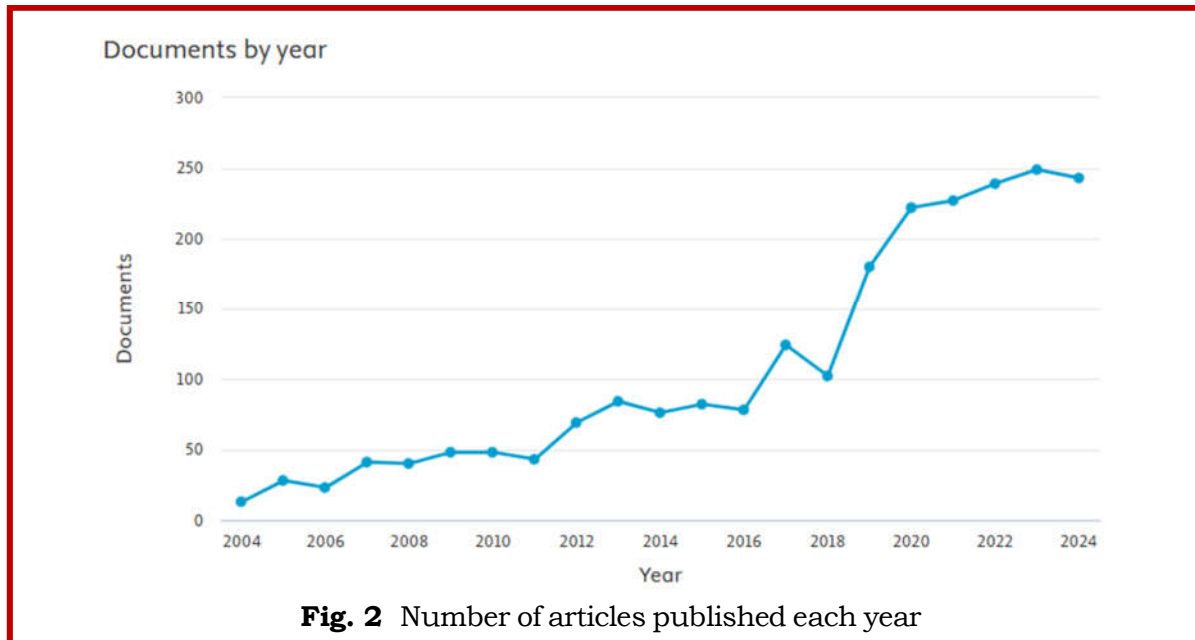
Year	Number of Articles Published	Information
2004	Increase	renewable agriculture and food systems
2005	Increase	agriculture and human values
2006-2008	Increase	environmental management
2009-2016	Fluctuation	coffee science
2017	Increase	agronomia mesoamericana
2018-2023	Increase	world development perspectives
2024	Annual Growth	regional environmental change
2024	Annual Growth	basic and applied ecology

The trend in the number of published articles on the topic of coffee marketing has shown significant development over the past two decades, reflecting the growing interest in various related fields. In the early period (2004–2005), there was an increase in publications focusing on sustainable agricultural systems and the relationship between farming and humanitarian values. This trend continued between 2006 and 2008, with greater emphasis on environmental management. However, during 2009–2016, the number of publications fluctuated, particularly in relation to research on coffee science. Nevertheless, beginning in 2017, the trend began to rise again with a focus on Mesoamerican agronomy. From 2018 to 2023, the growth in publications remained positive, especially from the perspective of global development. In 2024, publications recorded stable annual growth with particular attention given to regional environmental changes as well as basic and applied ecology. These thematic shifts reflect the evolving research focus in response to global needs and environmental challenges. Overall, this pattern demonstrates how scholarly publications on coffee marketing have adapted to current issues that are relevant across multiple fields.

Statistical data were also utilized to examine the major contributions of different publication sources to research on coffee marketing over the past two decades. Within this period, a total of 557 papers were published from various sources, including journal articles, conference papers, and book chapters. The analysis of Scopus data revealed that journals emerged as the dominant platform for disseminating research findings on coffee marketing. In contrast, the contributions of conference proceedings and book chapters that directly addressed this topic remained minimal, suggesting that these formats play a supplementary rather than primary role in advancing the field.

The predominance of journals underscores their role as the most influential medium for academic communication in this area of study. Journals not only provide rigorous peer-review mechanisms but also offer greater visibility and accessibility to a global readership. This makes them more effective in shaping scholarly discourse, highlighting research trends, and fostering the integration of findings into both theoretical and applied contexts of coffee marketing. Meanwhile, the relatively limited impact of conference papers and book chapters may be attributed to their narrower scope, shorter circulation period, or restricted audience reach, which reduces their capacity to influence broader academic and policy debates. Given these findings, it is advisable for researchers, academics, and practitioners to prioritize publishing their work in reputable journals that hold significant influence in the field of agricultural economics, agribusiness, and marketing. By doing so, their contributions are more likely to reach a wider scholarly and professional audience, thereby enhancing the visibility and impact of their research. This approach also ensures that studies on

coffee marketing are more effectively disseminated, enabling them to inform future investigations, guide policymaking, and support farmer-oriented strategies. Table 1 provides an overview of the top ten primary sources of scientific publications on this topic during the period from 2004 to 2024.



The figure above illustrates the trend in the number of documents published annually during the period 2004–2024. It is evident that publications increased significantly, particularly after 2018. Prior to 2010, the number of published documents remained relatively low and stable, with fewer than 50 publications per year. However, after 2015 a gradual rise was observed, followed by a sharp surge between 2019 and 2020. Within the context of the topic “Coffee Marketing Systems and Their Impact on Farmer Welfare,” this trend reflects a growing interest among researchers in the coffee sector, especially after 2018. The increase in publications may have been driven by the rising importance of discussions on more efficient coffee marketing to support farmer welfare, including the role of technology, globalization, and the growing awareness of sustainability in the coffee supply chain. Furthermore, the trend also highlights a broader push toward research focusing on solutions to improve the livelihoods of coffee farmers. The sharp increase in 2019–2020 may be linked to global initiatives or new policy developments affecting the coffee sector. This indicates that academic publications play a crucial role in promoting innovation and disseminating insights into the challenges and opportunities faced by coffee farmers.

Bibliometric Analysis

Coffee marketing strategies include direct marketing, collaboration with cooperatives, and the use of digital platforms. This study demonstrates that more efficient and innovative marketing models can significantly improve farmers’ income. In addition, access to international markets and certification programs are identified as key factors contributing to higher farmer welfare through more competitive selling prices. The research further explores the value chain in coffee marketing, from production processes to final distribution. By examining the role of each actor in the value chain such as farmers, traders, exporters, and other stakeholders, the study

identifies both the challenges and opportunities that influence farmer welfare. The findings suggest that strengthening farmers' bargaining power through education, training, and access to market information is crucial to overcoming structural weaknesses in the coffee supply chain. Empowered farmers are better positioned to negotiate fair prices, adopt sustainable practices, and access broader markets, which collectively contribute to improving their livelihoods. The bibliometric evidence emphasizes the importance of innovative marketing approaches and inclusive value chain participation as central elements for enhancing the global competitiveness of Indonesian coffee.

Table 2. Top 10 Source Titles Contributing to Coffee Marketing Research

Source titles	H-Index	Quartile
Agriculture, Ecosystems and Environment	212	Q1
Journal of the Science of Food and Agriculture	174	Q1
Computers and Electronics in Agriculture	168	Q1
Agriculture and Human Values	91	Q1
Culture, Agriculture, Food and Environment	17	Q1
International Journal of Agriculture and Biosciences	6	Q2
Basrah Journal of Agricultural Sciences	6	Q3
Journal of Library and Information Science in Agriculture	5	Q3
Journal of Agricultural Sciences (Belgrade)	4	Q4
Journal of Aridland Agriculture	3	Q4

This table presents the top ten source titles contributing to scientific publications in the field of agriculture. The data reveal that most of the leading sources, such as *Agriculture, Ecosystems and Environment* (H-Index 212), *Journal of the Science of Food and Agriculture* (H-Index 174), and *Computers and Electronics in Agriculture* (H-Index 168), are ranked Quartile 1 (Q1). This reflects the high quality and significant influence of these journals in advancing knowledge, particularly in relation to agricultural ecosystems, technological innovation, and value-added processes within the agricultural sector. Sources with lower H-indices, such as the *International Journal of Agriculture and Biosciences* (H-Index 6, Q2), along with lower-quartile journals like the *Basrah Journal of Agricultural Sciences* (Q3) and the *Journal of Agricultural Sciences (Belgrade)* (Q4), contribute to more specific or localized topics. Although their influence may not be as extensive as Q1 journals, these publications remain important for providing outlets for regional research that focuses on local challenges, including marketing systems. In the context of coffee marketing, findings from such journals can offer practical insights into the issues faced by smallholder farmers, particularly in efforts to improve marketing efficiency.

The relationship between these publication sources and the welfare of coffee farmers lies in the way research and innovations disseminated through these journals shape coffee marketing systems. Journals such as *Agriculture and Human Values* (Q1), which emphasize social and ethical aspects of agriculture, are particularly relevant in identifying approaches to sustainable, fair, and farmer-friendly coffee marketing. Meanwhile, technological innovations published in high-ranking journals such as *Computers and Electronics in Agriculture* provide technology-based solutions that can enhance efficiency and market access for coffee farmers. By adopting these research findings, coffee farmers may benefit from more stable income and reduced

dependency on exploitative distribution chains, ultimately contributing to improved livelihoods and greater resilience within the coffee sector.

Country Contributions

The data on country-level contributions to research are based on the number of documents, citations, and total link strength. The United Kingdom ranks first with 354 documents, 6,900 citations, and a total link strength of 260. This indicates that the country has made a significant contribution to research, not only by producing a considerable number of documents but also by exerting broad influence through citations and strong collaborative networks. The emphasis on link strength further demonstrates the United Kingdom's central role in fostering international research connections within the field of coffee marketing.

The United States holds second place, with the highest number of documents (830) and the largest citation count (14,848), but a slightly lower total link strength of 235. These results suggest that the United States excels in both research productivity and scholarly impact, while being slightly behind the United Kingdom in terms of research collaboration networks. This distinction highlights how different countries contribute to the advancement of coffee marketing studies, with the United States leading in volume and impact, while the United Kingdom demonstrates greater interconnectedness in global collaboration.

Table 3. Top 20 Countries Contributing to Coffee Marketing Research

Country	Documents	Citations	Total Link Strength
United States	199	596	16
Costa Rica	90	784	12
Germany	44	813	10
France	29	147	8
Netherlands	11	775	5
Colombia	59	125	3
United Kingdom	35	165	3
Ethiopia	60	506	2
Mexico	93	841	2
Belgium	53	152	2
Brazil	231	389	2
Nicaragua	25	197	2
Switzerland	48	880	2
Australia	54	323	2
Kenya	66	145	2
Uganda	68	254	2
Indonesia	47	315	2
Guatemala	20	313	2
Sweden	47	322	2
Malaysia	49	123	1

The table above presents the top twenty countries contributing to research on coffee marketing. The United States ranks first with 199 documents, 596 citations, and a total link strength of 16, highlighting its dominant role in this field. Countries such as Costa Rica and Germany, although producing fewer documents, recorded high citation counts of 784 and 813 respectively, reflecting the significant impact of their research. Meanwhile, countries like Brazil and Ethiopia, despite their higher number of documents, showed relatively lower citation levels. In the context of coffee marketing

systems, these contributions are closely linked to each country's role in studying coffee supply chains, sustainability, and farmer welfare. For example, nations such as Costa Rica, Colombia, Ethiopia, and Guatemala, recognized as major global coffee producers, have generated research that emphasizes improving marketing efficiency, adding value to coffee products, and optimizing distribution channels to enhance farmer income. These efforts contribute to sustaining the coffee sector by supporting farmers in gaining access to global markets and achieving fairer prices.

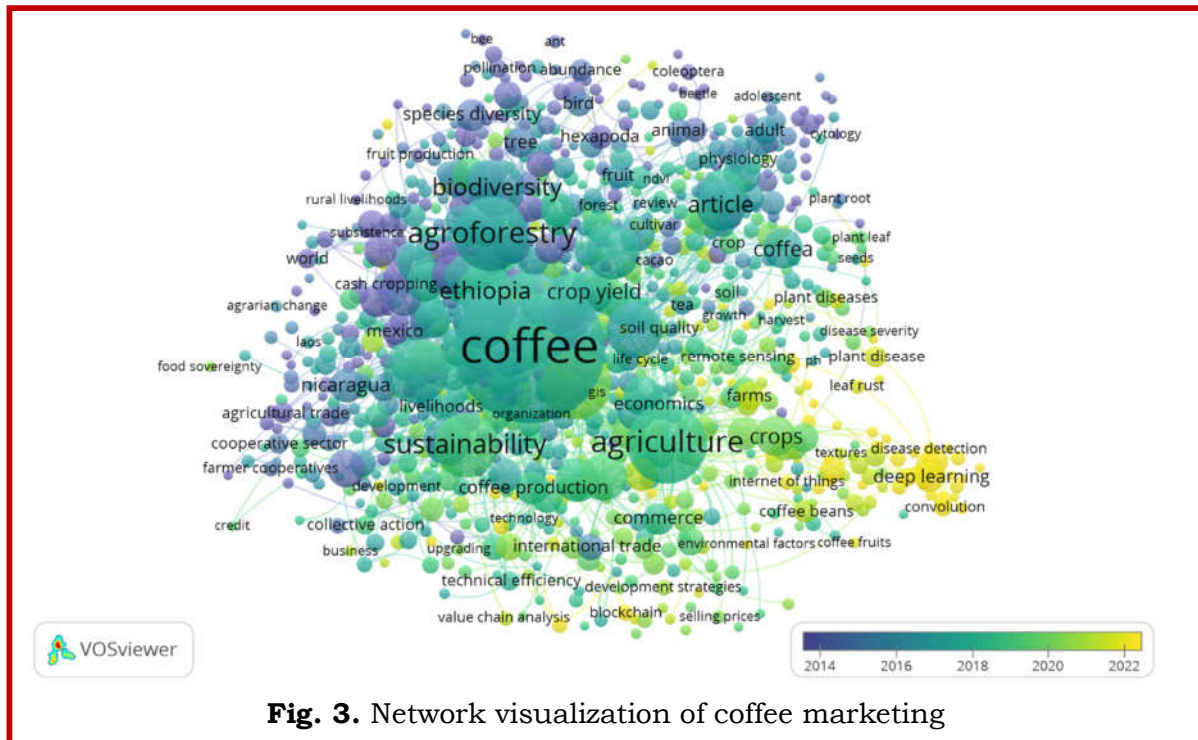
Farmer welfare is strongly influenced by the design and implementation of marketing systems. Countries such as Indonesia and Kenya, which are included in the table, can benefit from these research insights to strengthen local marketing strategies. By adopting technology or direct marketing systems, farmers can reduce dependency on intermediaries, increase their earnings, and better cope with fluctuations in global coffee prices. Overall, this table illustrates the breadth of global contributions to coffee marketing research, offering valuable guidance for policymaking and innovation aimed at improving the welfare of coffee farmers worldwide.

Keywords

The network representation generated by VOSviewer typically takes the form of a visual map that displays clusters of data in various colors, sizes, and distances between nodes. Each node represents a specific element, such as the keyword "coffee marketing system" or "farmer welfare," while the connecting lines between nodes indicate the intensity of the relationship between those elements. This visualization allows users to more easily identify patterns and trends within large and complex datasets. In the context of coffee marketing systems, VOSviewer can be used to map relationships among different aspects such as distribution chains, market actors, and marketing strategies. The resulting network visualization also illustrates how elements within the coffee marketing system influence farmer welfare. For example, if the node "market access" is strongly connected to the node "farmer income," it suggests that improved market access has the potential to enhance farmers' earnings. This information can be applied by stakeholders to design more effective interventions. By utilizing the results of network analysis produced by VOSviewer, decision-makers can develop data-driven strategies to strengthen coffee marketing systems and improve farmer welfare. For instance, if the visualization indicates that the node "partnership" has a strong influence on the cluster "sustainability," then strategic partnerships between farmers, cooperatives, and companies can be reinforced. In this way, the network representation generated by VOSviewer not only facilitates a deeper understanding of the system but also serves as a foundation for creating positive impacts for coffee farmers and the broader ecosystem.

Farmers who adopt sustainable agricultural practices tend to gain access to premium markets where coffee is valued at higher prices, thereby improving their overall income stability. This access not only strengthens their economic resilience but also provides long-term benefits in terms of environmental stewardship and social recognition. By implementing practices such as organic farming, shade-grown systems, integrated pest management, and reduced chemical use, farmers are able to produce coffee that meets international certification standards and appeals to environmentally conscious consumers. Such practices also enhance soil fertility, conserve biodiversity, and mitigate greenhouse gas emissions, which are crucial in the global fight against climate change. At the same time, sustainable farming reduces farmers' vulnerability to plant diseases and climate-related shocks, ensuring more reliable harvests in the future. Consequently, the adoption of sustainability-oriented methods empowers

farmers to secure fairer prices, access training and development opportunities, and build stronger partnerships with cooperatives and global buyers. Collectively, these factors contribute not only to improved livelihoods but also to strengthening the global positioning of coffee-producing countries that emphasize sustainability as a core element of their agricultural strategy.



The figure above represents a bibliometric visualization that illustrates the relationships among keywords in coffee-related research from 2014 to 2022. The central keyword “coffee” appears prominently in the middle of the network, surrounded by related terms such as “sustainability,” “agriculture,” “agroforestry,” “biodiversity,” and “deep learning.” This indicates that coffee research encompasses a wide scope, covering aspects of production, environment, technology, and trade. The different colors in the visualization represent the temporal development of these keywords, with yellow nodes indicating more recent research focuses. Within the context of coffee marketing systems, keywords such as “international trade,” “value chain analysis,” and “coffee production” are directly relevant. Studies in this area often emphasize supply chain efficiency, the role of technology in enhancing production, and global market analysis to ensure fair prices for farmers.

The emergence of innovation-related terms such as “blockchain” within the visualization also highlights how transparency in the supply chain can strengthen trust between farmers and buyers, ultimately contributing to improved farmer welfare. Environmental factors represented by keywords such as “biodiversity,” “agroforestry,” and “plant diseases” are equally influential in shaping coffee marketing systems. Farmers who adopt sustainable agricultural practices tend to gain access to premium markets where higher prices are offered for environmentally friendly and ethically produced coffee. This has a direct impact on their welfare by providing more stable income opportunities while simultaneously addressing challenges posed by climate

change and crop diseases that threaten yields. Taken together, the network visualization underscores the interconnectedness of environmental, technological, and market-oriented factors in advancing sustainable and equitable coffee marketing.

3.2. Discussion

The results of the analysis indicate a significant increase in the number of publications and scientific writings on coffee marketing indexed in Scopus. Each year, the volume of research has grown consistently, reflecting a rising interest in issues related to the development of learning models and the application of technology across various sectors. This upward trend demonstrates that coffee marketing has become a field of considerable attention within both academic and professional communities. Furthermore, the study reveals that the integration of technology in sectors such as marketing, agriculture, and farmer welfare, including coffee management, is increasingly recognized in research. These findings highlight the broad relevance of coffee marketing to multiple aspects of life, creating opportunities for innovation with a direct impact on improving community welfare. The steady growth of research in this area reflects the strength of the global market and the high level of enthusiasm for coffee marketing. The outcomes of this study are expected to provide valuable insights for researchers, practitioners, and policymakers in developing new approaches to technology-based education while fostering broader cross-disciplinary collaboration in the future.

Statistical Analysis

The statistical analysis reveals a clear upward trend in the number of publications on coffee marketing over the past two decades, with a notable surge between 2018 and 2023 and a significant peak in 2024. This trend reflects growing global attention to issues such as environmental change and ecology. The fluctuations observed during certain periods indicate that research on this topic has adapted in response to evolving global needs and challenges. Most studies on coffee marketing were published in high H-index journals ranked in the upper quartiles such as Q1, which demonstrates their significant influence in disseminating knowledge and stimulating further research in related fields. This emphasizes the importance of selecting publication outlets with broad coverage to maximize the impact of research.

The statistical data also help identify the primary contributions of different publication types, including journal articles, conference proceedings, and book chapters. The findings indicate that journals remain the dominant medium for disseminating research on coffee marketing, while the contributions of proceedings and book chapters are relatively smaller. This information encourages researchers to prioritize publishing in highly influential journals in order to expand the reach and visibility of their work. The shift in research focus, from agronomy to coffee marketing and environmental impacts, highlights academia's responsiveness to pressing global issues. Furthermore, the analysis underscores the role of publications in supporting innovation, sustainability, and community welfare, particularly for farmers. These insights provide a valuable foundation for guiding future research policies and strategies.

Bibliometric Analysis

The bibliometric analysis in this study highlights the role of key keywords such as "coffee," "sustainability," "agriculture," and "biodiversity" in coffee-related research. Bibliometric visualization reveals close relationships among various research elements, including marketing strategies, supply chains, and technology. The primary focus of

this study is on the efficiency of coffee marketing systems and their impact on farmer welfare. Strong connections among keywords indicate the interdependence between technical and social aspects of coffee marketing systems. The analysis also uncovers the temporal development of research priorities, represented by the colors in the network visualization. The emergence of new keywords such as “deep learning” and “blockchain” reflects relevant technological innovations that support sustainability in the coffee sector. These trends demonstrate that research has moved beyond traditional aspects such as production and distribution to also address modern technologies aimed at improving supply chain transparency and the competitiveness of coffee products in global markets.

The analysis of the coffee value chain identifies the critical roles of all actors, from farmers to exporters. Keywords such as “value chain analysis” and “international trade” emphasize the importance of collaboration among stakeholders to establish more efficient marketing systems. This study also highlights opportunities for innovation, such as the adoption of digital technologies and direct marketing models, to enhance farmers’ incomes. At the same time, challenges such as global price fluctuations and market access remain central concerns requiring data-driven interventions. The findings from bibliometric analysis provide insights that support the design of fairer and more sustainable coffee marketing strategies. The emphasis on sustainability suggests that environmentally friendly practices, such as agroforestry, can improve access to premium markets while enhancing farmer welfare. Network visualizations further underscore the importance of partnerships among farmers, cooperatives, and market actors in creating more transparent and efficient distribution systems. With the integration of innovation, research, and appropriate policy, coffee farmers’ welfare can be significantly improved.

Country Contributions

The United States ranks first in its contribution to research on coffee marketing, with the highest number of documents (830) and the largest citation count, indicating significant productivity and research impact. However, the United Kingdom demonstrates a leading role in collaborative networks with a higher total link strength (260). This finding suggests that both countries play important roles, with the United States contributing primarily through productivity and innovation, while the United Kingdom excels in fostering broad international research collaboration. Coffee-producing countries such as Costa Rica, Colombia, Ethiopia, and Guatemala also contribute substantially to coffee marketing research. Their studies often focus on strategies to improve efficiency, value addition, and sustainability in the coffee sector. The impact of these contributions is evident in the development of marketing systems that enable coffee farmers to access global markets, secure fair prices, and improve their welfare.

Research from countries such as Indonesia and Kenya highlights strong relevance to local challenges. Strategies such as direct marketing and the use of technology have been identified as solutions to increase farmer income and reduce dependency on intermediaries. These findings provide guidance for governments and industry stakeholders in designing policies that support farmer welfare. Meanwhile, contributions from countries with strong research capacity, such as Germany and the Netherlands, open opportunities for the adoption of technological and marketing system innovations. Research on the use of technologies such as blockchain and deep learning shows potential to enhance transparency and efficiency in the coffee supply chain. These developments represent strategic steps to improve farmers’

competitiveness in global markets while simultaneously supporting sustainability.

Keywords

Key terms such as “coffee,” “sustainability,” “agriculture,” and “biodiversity” stand out as central focuses in coffee-related research. This reflects a holistic approach that integrates production, environmental, and sustainability dimensions within the coffee supply chain. The dominance of these keywords indicates that recent studies pay considerable attention to global challenges such as climate change, sustainable farming practices, and their implications for farmer welfare. Keywords like “deep learning” and “remote sensing” highlight the increasing importance of technology in supporting coffee production and marketing. These technologies enable early detection of plant diseases, yield prediction, and enhanced production efficiency. Research on such technological applications not only improves product quality but also strengthens farmers’ positions in global markets, providing opportunities for access to premium markets with better prices.

Other significant keywords, such as “value chain analysis,” “international trade,” and “marketing strategies,” point to growing interest in the efficiency and fairness of the coffee supply chain. Research focusing on these aspects helps to clarify the contributions of each actor in the value chain, including farmers, exporters, and buyers, toward the sustainability of the coffee sector. In addition, strategies such as digital marketing and product certification emerge as solutions for increasing farmers’ income through more direct access to international markets. The appearance of keywords like “agroforestry” and “plant diseases” indicates that research also addresses environmental challenges faced by coffee farmers. Farmers who adopt sustainable practices such as agroforestry have the potential to benefit from premium markets. Moreover, strengthening partnerships among farmers, cooperatives, and companies represents a strategic step toward improving supply chain efficiency and enhancing overall farmer welfare.

4. Conclusion

Based on the analysis, the publication trend on coffee marketing has shown a significant increase, particularly in the past five years, reflecting global attention to environmental and sustainability issues. Most of these studies were published in highly reputable journals, strengthening their academic impact. The research focus also demonstrates a shift in response to global challenges, moving from agronomy-centered topics toward coffee marketing and sustainability. Moreover, bibliometric analysis highlights the role of modern technologies such as deep learning and blockchain in improving efficiency and transparency within the coffee supply chain, with the primary objective of enhancing farmer welfare. These innovations not only provide practical solutions to existing challenges but also contribute to the development of fairer and more sustainable marketing systems. Contributions from developed countries such as the United States and the United Kingdom, alongside coffee-producing countries, underscore the importance of strategic global collaboration. In producer countries such as Indonesia, Kenya, and Colombia, research focuses on direct marketing and technology adoption to increase farmer income and improve supply chain efficiency. The adoption of advanced technologies and environmentally friendly practices, such as agroforestry, is identified as a critical step in supporting sustainability and strengthening competitiveness in global markets. With appropriate strategies, this study provides policy-relevant guidance to support innovation, farmer welfare, and the holistic sustainability of the coffee sector. Research in Indonesia emphasizes the relevance of local issues, including challenges faced by coffee farmers in dealing with

global price fluctuations and dependence on intermediaries within the supply chain. Strategies such as direct marketing and the adoption of digital technologies have been identified as effective solutions to improve farmers' income and strengthen their position in global markets. The use of advanced technologies, such as blockchain, also offers opportunities to enhance transparency and efficiency in coffee distribution. Furthermore, sustainable farming practices such as agroforestry not only allow farmers to access premium markets but also support broader environmental sustainability efforts. This research provides valuable insights for policymakers and industry stakeholders in Indonesia to design strategies that can increase the competitiveness of Indonesian coffee in international markets while simultaneously supporting the sustainable welfare of farmers.

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