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Agribusiness Cooperation Models and Ethical Consent: A Bibliometric Review (2020–2025)

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ABSTRACT

The agribusiness sector faced increasing challenges due to global market complexities and rapid technological change. Despite the growing recognition of sustainable practices and cooperation model, there was limited systematic analysis of how these elements developed in recent years. Furthermore, the integration of digital platforms and agriculture 4.0 created new opportunities and ethical concerns that had not been fully explored. This study addressed these gaps by conducting a bibliometric review of research on sustainable agribusiness cooperation and ethical consent practices published between 2020 and 2025. The review synthetized existing literature to clarify emerging frameworks that guided sustainable and ethical agribusiness practices. The research contributed by mapping cooperation models and ethical frameworks in agribusiness and by offering insights into how technological innovations were integrated into sustainable business strategies. It provided structured evidence for policymakers, researchers, and practitioners to strengthen both ethical governance and sectoral competitiveness. The study applied a bibliometric approach using records retrieved from Scopus database. A structured Boolean search produced 174 records, which were screened for relevance's and duplicates, resulting 147 documents for analysis. The data were analyzed to examine authorship, publication trends, geographical distribution, sources, and keyword evolutions. The result showed that the articles formed most of the publication (67.3%), followed by conference papers (26.5%). Indonesia, Brazil, and Russia emerged as leading contributors, reflecting their roles in global agribusiness. Annual output peaked in 2021 before stabilizing in subsequent years. Conference proceedings were a dominant channel of dissemination, while journals showed steady contributions. Keyword mapping revealed strong connections between agribusiness, cooperatives and sustainability, with growing emphasis on digital platforms, agroindustry, and agriculture 4.0 in later years. In conclusion, the study demonstrated that agribusiness research evolved toward technology-driven, sustainability-oriented, and cooperative models, though comprehensive reviews remained limited. These findings provided a foundation for future research and practical strategies in advancing ethical and sustainable agribusiness.

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1. INTRODUCTION

The agribusiness sector plays a pivotal role in driving economic development and ensuring food security [1], [2], [3], [4], especially in developing regions like Indonesia [5]. The increasing complexity of global markets, environmental challenges, and technological advancements has necessitated the development of new cooperation models and ethical practices within the sector. Agribusinesses must adapt to these changes through innovative collaborations, sustainable practices, and the adoption of emerging technologies like digital platforms and Agriculture 4.0 [6]. These transformations, however, bring about a set of challenges that require systematic research and analysis to ensure that agribusinesses can remain competitive while addressing ethical concerns related to environmental sustainability, social responsibility, and governance.

The primary research problem lies in identifying the key agribusiness cooperation models and ethical consent practices that have emerged in recent years [7], [8], [9], [10]. While the literature highlights the growing role of sustainable agribusiness practices, there is limited research that systematically analyzes the cooperation models and ethical frameworks implemented across the global agribusiness sector from 2020 to 2025 [11], [12]. Moreover, the rapid development of digital platforms and technology in agribusiness is reshaping traditional cooperation models, but there is insufficient understanding of how these innovations impact ethical consent and sustainable practices. This gap in knowledge necessitates a comprehensive bibliometric review of the literature on agribusiness cooperation models, ethical practices, and technological integration within the sector.

The transformation of agribusiness through digital platforms and technological innovations, such as Agriculture 4.0, presents both opportunities and challenges [13], [14], [15], [16]. However, there is a noticeable gap in the literature that explores the intersection of these technological advancements with cooperation models and ethical consent in agribusiness. While there has been significant focus on sustainable practices and innovation in agribusiness, much of the research lacks a comprehensive examination of how these factors interact to create ethical, sustainable, and cooperative business models.

This article is driven by the need to address this gap by conducting a bibliometric review of the key agribusiness cooperation models and ethical consent practices emerging from 2020 to 2025. By synthesizing and analyzing the latest research, this article seeks to provide a thorough understanding of how agribusinesses are evolving in response to contemporary challenges and technological changes. The goal is not only to enhance the academic discourse but also to provide practical insights that can inform policymakers, industry leaders, and stakeholders about how to navigate the complex terrain of ethical and sustainable agribusiness practices.

In response to these challenges, this research aims to explore the evolving landscape of agribusiness cooperation and ethical consent, with a specific focus on the years 2020 to 2025. The study will systematically review relevant literature to identify and categorize the key models of cooperation, ethical consent practices, and technological advancements that are shaping the future of agribusiness. By utilizing a bibliometric approach, the research will provide a comprehensive overview of the current state of agribusiness research, highlighting emerging trends, geographical patterns, and key contributors to the field. This approach will also shed light on the evolving role of digital platforms and sustainable practices in promoting cooperation and addressing ethical challenges in agribusiness.

This gap is particularly evident in the absence of comprehensive bibliometric reviews that capture the intersection of sustainability, cooperation models, and ethical frameworks from 2020 to 2025—a period marked by accelerated digital transformation and global disruptions such as the COVID-19 pandemic. Existing works highlight sustainability and innovation, but few systematically examine how these themes interact with ethical consent, technological adoption, and cooperation structures in agribusiness.

Addressing this shortfall, the present study conducts a bibliometric review of agribusiness cooperation models and ethical consent practices published between 2020 and 2025. By mapping publication trends, authorship, keyword evolution, and geographical contributions, this study clarifies the emerging frameworks guiding sustainable and ethical agribusiness. The contribution is twofold: first, it provides a structured synthesis of cooperation and ethical practices that support the development of sustainable business strategies; second, it highlights the integration of digital platforms, entrepreneurship, and Agriculture 4.0 as novel forces reshaping agribusiness. In doing so, the article advances both the academic discourse and provides actionable insights for policymakers, researchers, and practitioners.

This study addresses this gap by conducting a bibliometric review of publications on agribusiness cooperation models and ethical consent practices between 2020 and 2025. It makes three key contributions: (1) it provides a structured mapping of global research trends, publication patterns, and keyword evolution; (2) it identifies emerging cooperation models and ethical frameworks that reflect the sector's transition toward sustainable and technology-driven practices; and (3) it offers actionable insights for policymakers, researchers, and practitioners to strengthen ethical governance and competitiveness in agribusiness. By clarifying the

interplay between sustainability, cooperation, and digital innovation, this article advances the state of knowledge and contributes to shaping future agribusiness strategies.

2. METHODS

2.1. Topic Selection and Scope

The first step in the process involves selecting the research topics, which in this case are "Sustainable Agribusiness" and "Cooperation" (Fig. 1). These terms were chosen as keywords for the search to ensure relevant literature is captured. The scope of the study is set by defining the inclusion criteria, such as the time frame (2020-2025) and the source of data (Scopus database). This step ensures that the study will only include recent and relevant publications.

2.2. Keyword and Boolean Code Construction

Once the topics are defined, the next step is to build the search query using a combination of keywords and Boolean operators. The Boolean code in the diagram combines various keywords related to agribusiness, cooperation, and ethical consent, ensuring that the search covers all relevant articles. The search query is structured to retrieve documents that match these keywords in the title or abstract and fall within the specified publication year range. This is a crucial step to refine and focus the search results to the most pertinent publications.

2.3. Data Extraction and Record Screening

After executing the search, the data is extracted, and the identified records are screened. Initially, 174 records are identified and screened for duplicates and relevance. This step ensures that the literature included in the analysis meets the predefined criteria and is not redundant. The screening process involves reviewing the records based on the title, abstract, and publication details.

2.4. Record Removal and Inclusion for Bibliometric Analysis

In this phase, duplicate records are removed, reducing the total number of records from 174 to 147. The remaining records are then included for bibliometric analysis. This includes analyzing the metadata, such as authorship, publication sources, citation counts, and other relevant bibliometric indicators, to extract meaningful insights from the literature. The bibliometric analysis helps to understand trends, patterns, and key contributors in the field of sustainable agribusiness and cooperation.

3. RESULTS AND DISCUSSION

3.1. Analysis of Agribusiness Cooperation Models and Ethical Practices in Recent Literature

The pie chart illustrates the distribution of document types included in the bibliometric review on agribusiness cooperation models and ethical consent practices between 2020 and 2025 (Fig. 2). As depicted, articles constitute many of the documents (67.3%), followed by conference papers at 26.5%. Review documents make up a smaller portion (4.8%), and books are the least represented (1.4%). This distribution suggests that most of the research in this field is published as articles, reflecting the primary format for disseminating scholarly findings.

The prominence of articles in the bibliometric review is typical in fields that are rapidly evolving, such as agribusiness. Articles are often seen as a preferred format for reporting new findings, reflecting the ongoing development of cooperation models and ethical practices. The higher percentage of conference papers (26.5%) indicates an active academic discourse within the agribusiness community, where research findings are frequently shared at professional events, enabling the exchange of ideas and fostering collaboration among researchers.

The bibliometric review identified that journal articles dominate agribusiness cooperation research, followed by conference proceedings. While the figure already show this distribution, the key insight is that conferences serve as an important platform for rapid dissemination of emerging ideas, while journals provide more stable contributions over time. This reflects the dynamic nature of agribusiness research, where scholars frequently test early findings at conferences before refining them into journal publications. Similar patterns have been reported in bibliometric studies of agri-food innovation and digital agriculture, which also highlight conferences as critical spaces for methodological and conceptual development.

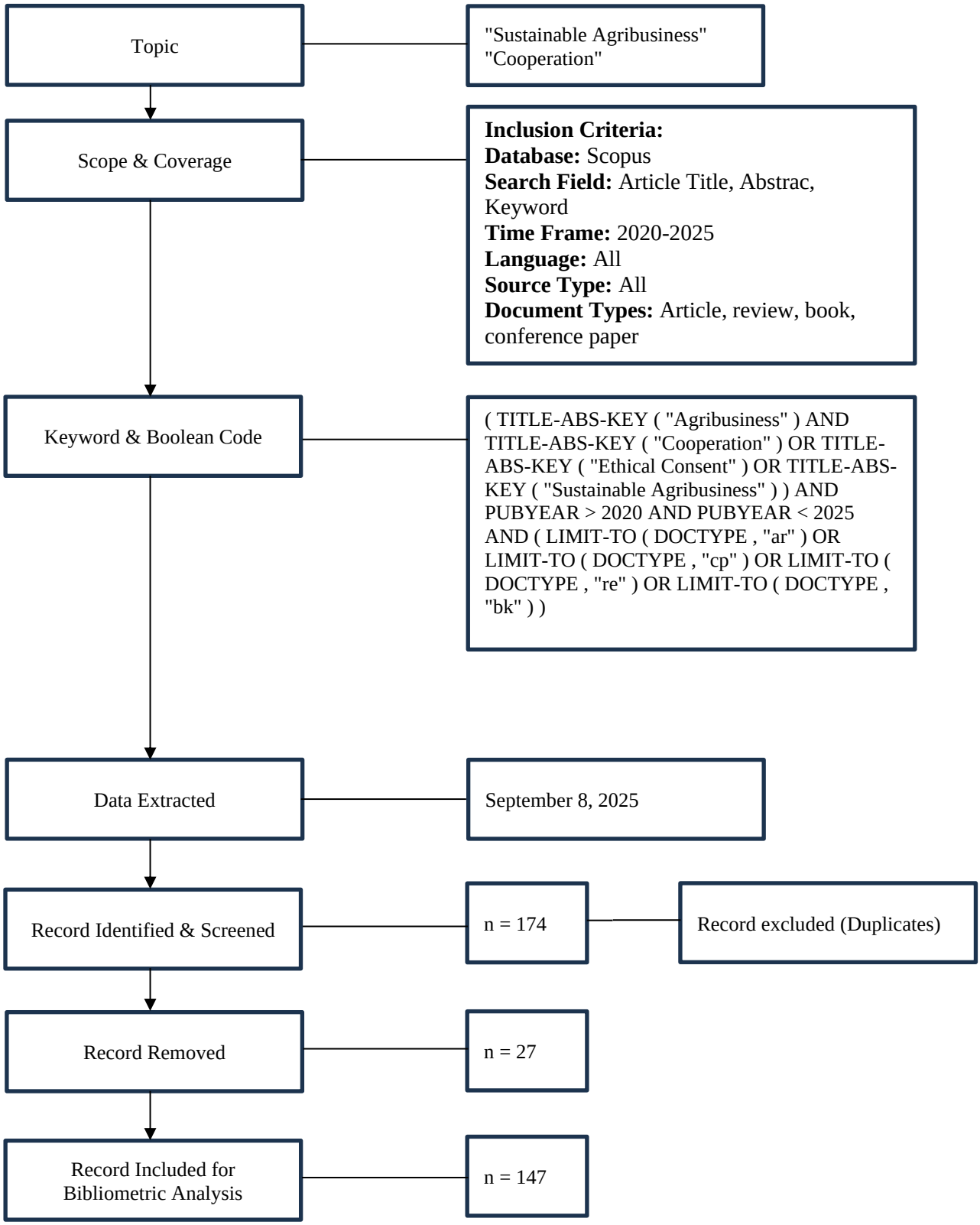


Fig 1. Flow diagram of Zakaria [17]

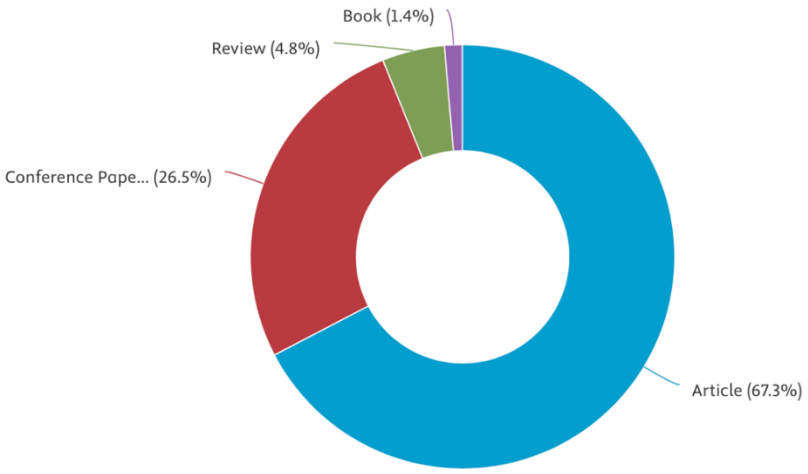


Fig. 2. Distribution of Document Types in the Agribusiness Cooperation and Ethical Consent Bibliometric Review (2020-2025)

Comparatively, the relatively low proportion of books (1.4%) suggests that the area of agribusiness cooperation models and ethical consent practices is still emerging, with much of the knowledge still being shaped through shorter-form publications such as articles and conference papers. This pattern contrasts with more established fields where comprehensive books or edited volumes are more common. Furthermore, the small percentage of review articles (4.8%) suggests that comprehensive synthesis of the research in this area is still limited, highlighting a gap in the field for more integrative analyses or overviews of current trends and findings in agribusiness cooperation and ethical consent practices.

3.2. Regional Distribution of Agribusiness Cooperation Documents

The bar chart (Fig. 3) illustrates the distribution of documents by country or territory related to agribusiness cooperation models and ethical consent practices in the bibliometric review from 2020 to 2025. Indonesia is the leading contributor, followed by Brazil and the Russian Federation. Other countries, including Ukraine, India, and Germany, also show significant involvement, but the volume of documents from these regions is considerably lower compared to Indonesia. The chart highlights the global nature of the topic, with countries from various continents actively contributing to the research.

The prominence of Indonesia (the highest number of documents) indicates that it may be a major focus of research on agribusiness cooperation and ethical practices, potentially due to its growing agribusiness sector and related ethical challenges. The substantial contributions from Brazil and Russia reflect their prominent roles in global agribusiness, suggesting that similar cooperation models and ethical concerns are shared across these major agricultural regions.

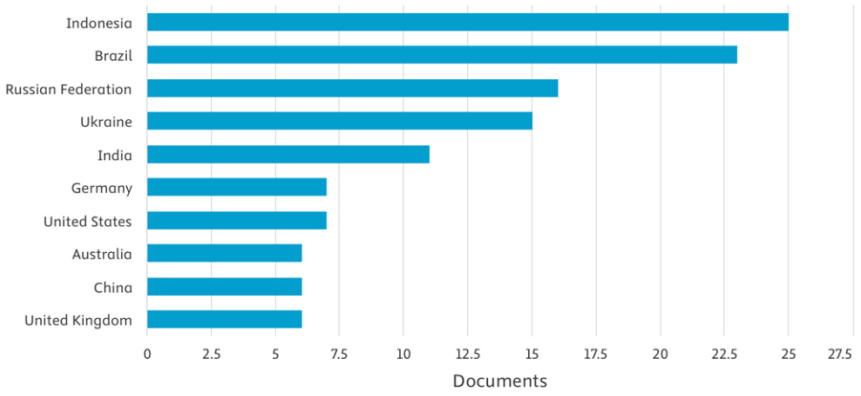


Fig. 3. Annual scientific production (2015–2025) in rural development and agribusiness, showing an overall upward trend with peak output in 2024.

Indonesia emerged as the leading contributor, followed by Brazil and Russia. Rather than repeating the chart values, it is important to interpret these results in context. Indonesia's prominence aligns with its national emphasis on food security, digital agribusiness programs, and cooperative farming models, particularly after the COVID-19 pandemic. Brazil's role reflects its global position as an agricultural powerhouse with significant investment in sustainability and Agri-tech. Russia's contribution, meanwhile, mirrors its strong state-driven agricultural modernization policies. Compared to earlier bibliometric reviews of agribusiness (e.g., studies in Sustainability and Technological Forecasting & Social Change), this review shows a stronger concentration of research output in emerging economies, suggesting a geographical shift in leadership within agribusiness scholarship.

The relative representation of other countries, such as the United States, China, and India, highlights the global interest in agribusiness, although the number of documents from these countries is smaller. This could suggest that while these nations are involved in research, they might not be as central to the discourse on agribusiness cooperation models and ethical consent practices. The diverse geographical representation also points to the universal relevance of agribusiness cooperation and ethical practices, where regions with varied agricultural systems are contributing to the development of this field. However, there is a gap in certain regions, such as the United Kingdom, where fewer documents are published on the topic, potentially indicating an area for further research or collaboration.

3.3. Annual Distribution of Agribusiness Cooperation and Ethical Consent Documents by Source

The line graph (Fig. 4) shows the number of documents published annually across different sources related to agribusiness cooperation and ethical consent practices. The source "E3s Web of Conferences" had the most significant increase in document counts, particularly peaking in 2022, while "Iop Conference Series Earth and Environmental Science" saw an early rise in 2021, followed by a sharp drop. Other sources like "Bio Web of Conferences," "Agriculture Switzerland," and "British Food Journal" experienced gradual and modest increases in document counts over the years. This chart highlights a fluctuating trend in research output, with notable peaks for some sources and minimal or steady contributions from others.

The prominent surge in publications from "E3s Web of Conferences" in 2022 likely reflects a pivotal event or significant conference in the field of agribusiness and ethical consent practices, which may have attracted substantial academic attention. It can be inferred that conference proceedings are a major vehicle for disseminating timely research in this area, aligning with the high visibility and the interdisciplinary nature of such events. This is consistent with previous research that indicates the role of conferences in accelerating the diffusion of emerging trends and innovations, particularly in fields that experience rapid changes, such as agribusiness cooperation models and ethics.

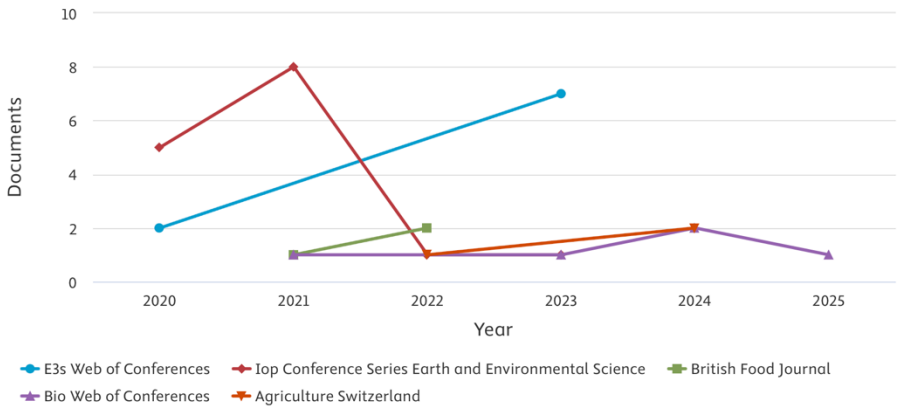


Fig. 4. Documents per Year by Source in the Agribusiness Cooperation and Ethical Consent Bibliometric Review (2020-2025)

E3S Web of Conferences stands out as a major outlet, indicating the importance of multidisciplinary venues for agribusiness topics. However, unlike previous reviews of food security research that show strong dominance by high-impact journals, agribusiness cooperation studies appear more evenly distributed across conference proceedings and medium-tier journals. This suggests the field is still consolidating its theoretical frameworks, relying on a mix of exploratory and applied research outputs.

In contrast, "Iop Conference Series Earth and Environmental Science" shows a brief spike followed by a rapid decline, suggesting that while the source might have attracted attention during a specific year, it did not maintain sustained interest in subsequent years. This could be due to the targeted nature of the conference or a possible shift in academic focus. On the other hand, the steady publication growth from "Bio Web of Conferences" and "Agriculture Switzerland" demonstrates the increasing integration of agribusiness cooperation models into broader agricultural research, albeit with less dramatic fluctuations. These gradual increases could reflect ongoing academic engagement in agribusiness, indicating that while the research is important, it does not yet experience the same high-profile, concentrated attention as conference proceedings like those from "E3s Web of Conferences." [18], [19]

3.4. Yearly Distribution of Agribusiness Cooperation and Ethical Consent Documents

The line graph (Fig. 5) shows the number of documents published each year on agribusiness cooperation models and ethical consent practices from 2020 to 2025. A sharp peak in 2021, with 34 documents, is followed by a significant decline in 2022. After that, document counts fluctuate but remain relatively stable, with no further sharp increases or decreases. This trend suggests a major event or focusses in 2021 that led to heightened publication activity, followed by a normalization in the years thereafter.

The sharp peak in 2021 may indicate a particular event, such as a conference, policy shift, or research breakthrough that spurred widespread academic attention in the agribusiness cooperation field. This surge could be attributed to a rising global awareness of the importance of ethical practices in agribusiness, particularly during the pandemic and its aftermath [20], [21], [22], [23]. The decrease in 2022 suggests that the initial enthusiasm waned or that funding, research priorities, or institutional support shifted, leading to fewer publications.

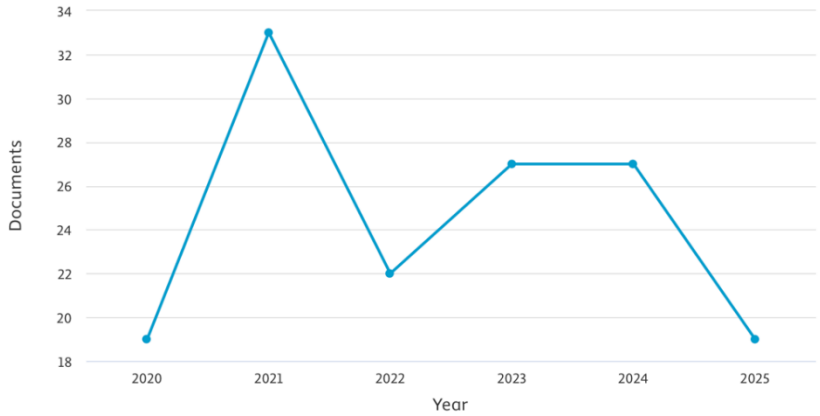


Fig. 5. Yearly Distribution of Documents in Agribusiness Cooperation and Ethical Consent (2020-2025)

The relatively stable yet fluctuating document counts in the following years (2023-2025) suggest a return to a more sustainable level of research output. This pattern is common in academic fields where initial bursts of interest are followed by gradual, steady research as the topic becomes more integrated into established academic and professional frameworks. This trend reflects the evolving nature of research, where interest peaks during transformative moments but stabilizes as the topic matures and becomes part of routine academic inquiry [24], [25].

3.5. Agribusiness and Cooperation Models: Key Terms and Their Interconnections

The network map (Fig. 6) visualizes the key terms and concepts that frequently appear in the literature surrounding agribusiness cooperation and ethical consent practices. Central terms like "agribusiness" and "agriculture" are closely linked to related concepts such as "cooperatives," "business," and "investment." Additionally, terms like "sustainable development," "climate change," and "financial institutions" highlight the broader environmental and economic factors influencing agribusiness practices. The connections between these terms indicate how research on agribusiness is highly interdisciplinary, involving areas such as economics, sustainability, social capital, and digital platforms.

The strong connections between terms like "agribusiness," "agriculture," and "cooperatives" reflect the core focus of the literature, which examines how agricultural practices and business models intersect. Agribusiness is positioned at the heart of the network, linking various aspects of the agricultural sector, from

"food supply" and "marketing" to more specialized terms like "agroecology" and "crops." This suggests that the research primarily explores business practices within agriculture, but also considers the environmental, social, and technological factors shaping the industry.

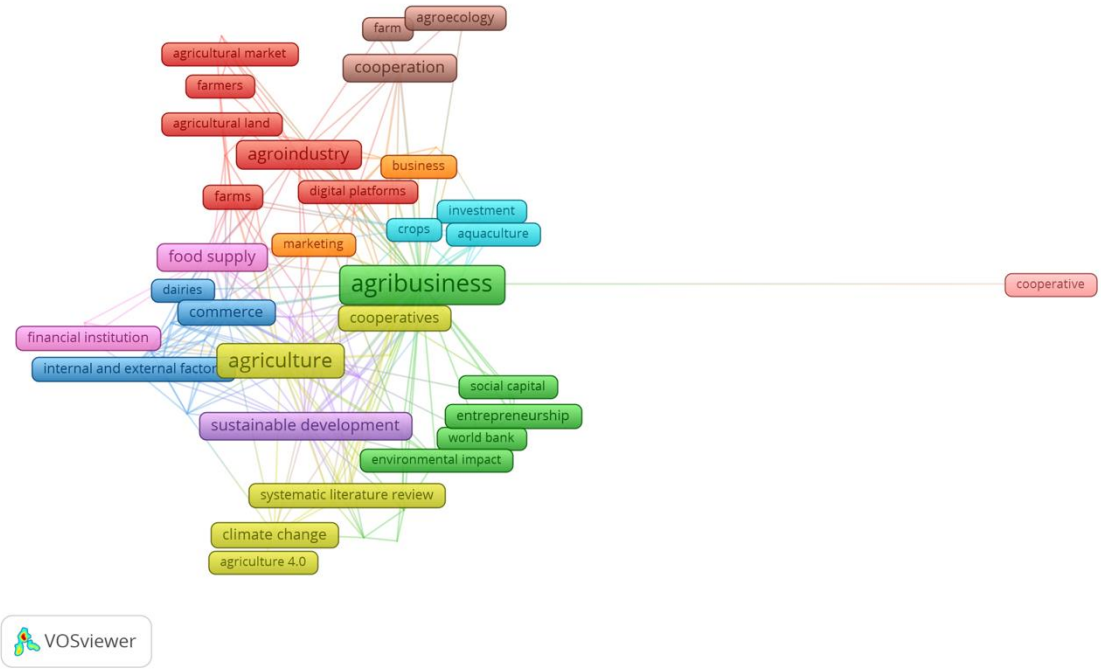


Fig. 6. Keyword Network Analysis of Agribusiness Cooperation and Ethical Consent Practices (2020-2025)

Keyword co-occurrence mapping highlights three main clusters: (1) sustainability and climate change; (2) cooperation and social capital; and (3) digital platforms and agroindustry. This finding aligns with previous reviews in agri-food systems, but the increasing linkage between digital platforms and agribusiness cooperation represents a newer trajectory. In particular, the integration of digital tools for price transparency, supply chain traceability, and cooperative governance illustrates how agribusiness research is expanding beyond traditional production concerns toward systemic digital transformation.

Furthermore, the presence of terms such as "sustainable development" and "climate change" demonstrates the growing attention to the environmental impact of agribusiness practices. This aligns with the increasing emphasis in recent literature on the need for agribusinesses to adapt to sustainability challenges, including the transition to more eco-friendly practices. Additionally, terms like "social capital" and "entrepreneurship" point to the importance of community-based initiatives and innovation in agribusiness cooperation models. This shows that modern agribusiness research is not solely focused on economic growth but also on building resilient, sustainable, and socially responsible systems. The inclusion of "digital platforms" also highlights the role of technology in transforming agribusiness, facilitating new business models and improving efficiency [26], [27], [28].

3.6. Novelty and Evolution of Keywords in Agribusiness Cooperation and Ethical Consent

The network map (Fig. 7) visually represents the evolution of key terms in agribusiness cooperation and ethical consent practices between 2021 and 2024. The color gradient reflects the time of publication, with older terms shown in purple (2021) and more recent terms in yellow (2024). This analysis highlights how the focus of research has shifted over the years. For instance, the prominence of terms like "agroindustry," "digital platforms," and "entrepreneurship" in 2023-2024 reflects an increasing integration of technology, business models, and entrepreneurship into the agribusiness discourse.

The shift in keyword prominence from 2021 to 2024 indicates a growing emphasis on digital innovation and entrepreneurship within the agribusiness field. As digital platforms and business models (e.g., "digital platforms," "entrepreneurship," "cooperatives") gain importance, it suggests that the agribusiness sector is increasingly adopting technological tools to enhance productivity, reach new markets, and innovate within its value chains. The rise of terms like "agroindustry" and "marketing" further underscores the sector's transition

towards more commercialized and market-driven approaches, influenced by both digital technology and new economic paradigms.

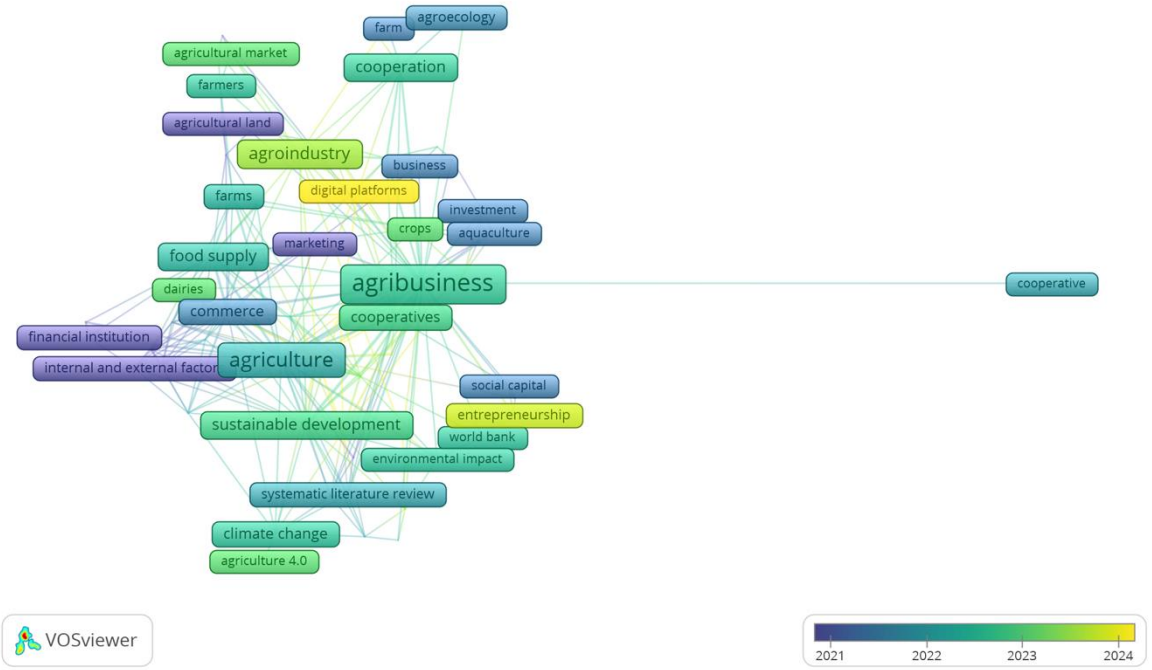


Fig. 7. Keyword Novelty and Evolution in Agribusiness Cooperation and Ethical Consent Literature (2021-2024)

A major contribution of this review lies in tracing keyword evolution between 2020 and 2025. Earlier years (2020–2021) focused heavily on “sustainability” and “cooperatives,” while later years (2023–2024) introduced novel terms such as “Agriculture 4.0,” “digital platforms,” and “entrepreneurship.” This reflects a clear transition from traditional sustainability discourse toward innovation-driven models that combine technology, business development, and ethics. Compared to earlier bibliometric studies that emphasized environmental or socio-economic dimensions, this review highlights the novelty of technology–ethics integration as a defining feature of contemporary agribusiness scholarship.

Additionally, the prominence of terms like "sustainable development," "climate change," and "environmental impact" reflects the increasing awareness and importance of environmental and social responsibility in agribusiness practices [29], [30], [31]. These shifts may be driven by growing global challenges related to climate change and sustainability, prompting the agribusiness sector to adopt practices that are both profitable and environmentally sustainable. The appearance of newer terms like "agriculture 4.0" signals a shift toward smart agriculture, indicating the sector's embrace of Industry 4.0 technologies, such as automation, IoT, and big data, to address emerging challenges in a rapidly evolving global market.

These findings suggest that agribusiness cooperation models are increasingly shaped by both digital innovation and ethical considerations. For policymakers, this highlights the need to strengthen regulatory frameworks around digital agriculture, ensuring equitable access to platforms and fair data governance. For practitioners, the emphasis on entrepreneurship and Agriculture 4.0 provides opportunities to leverage innovation for competitiveness while addressing sustainability challenges.

4. CONCLUSION

This study conducted a bibliometric review of agribusiness cooperation models and ethical consent practices published between 2020 and 2025. The analysis revealed that research in this field has increasingly shifted toward sustainability-oriented, technology-driven, and cooperative models, with conferences serving as major outlets for emerging scholarship.

The main contributions of this study are threefold:

a) Bibliometric mapping of global publication trends, authorship patterns, and geographical contributions in agribusiness cooperation and ethics.

b) Identification of emerging themes such as digital platforms, Agriculture 4.0, and entrepreneurship, which reflect the sector's transition toward innovation-driven and technology-integrated practices.
c) Guidance for future research, highlighting the need to integrate sustainability, ethics, and digital transformation in a more holistic manner.

From a practical perspective, the findings offer important implications for policymakers and practitioners. Policymakers should strengthen governance frameworks for digital agribusiness platforms, promote equitable access to technology for smallholder farmers, and ensure that ethical principles guide the rapid adoption of Agriculture 4.0. For practitioners, the emphasis on cooperative models and entrepreneurship underscores the potential of leveraging innovation not only for competitiveness but also for inclusive and sustainable development.

Future work should complement this bibliometric mapping with empirical case studies that compare cooperation models across regions, assess the real-world implementation of ethical consent frameworks, and evaluate the socio-economic impact of digital platforms on smallholder farmers. Expanding analysis to other databases (e.g., Web of Science) and applying mixed methods (bibliometric + qualitative content analysis) would also enhance the robustness of future research.

Author Contribution
All authors contributed.

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