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A Decade of Agribusiness Research: Bibliometric Insights into Rural Development Trends (2015–2025)

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ABSTRACT

Rural development plays a crucial role in ensuring food security, environmental sustainability, and socio-economic stability. Agribusiness provides integrated solutions to rural challenges, yet global research trends in this area remain fragmented and underexplored. This study conducted a bibliometric analysis of 144 documents indexed in the Web of Science (2015–2025). Using R and VOS viewer, we mapped publication trends, co-authorship networks, keyword co-occurrence, and thematic clusters to track research dynamics and emerging themes. The analysis shows an annual growth rate of 11.61%, moderate international collaboration (21.53%), and the dominance of motor themes such as rural development, agroindustry, and smallholder farming. Basic themes including regional planning and agriculture remain central but underdeveloped, while emerging concepts like entrepreneurship, investment, and regression analysis reflect a shift toward market driven and data-informed approaches. This study consolidates a decade of fragmented scholarship, identifies gaps in conceptual integration, and highlights opportunities for strengthening cross sectoral collaboration, sustainability, and digital transformation in rural agribusiness research. It provides a roadmap for future studies and policy design aimed at inclusive rural transformation.

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1. INTRODUCTION

Rural development holds global significance as it underpins food production, environmental stewardship, and socio-economic stability, with rural areas playing a crucial role in sustaining agricultural output and managing natural resources [1], [2]. However, these regions face persistent challenges such as poverty, limited infrastructure, and resource constraints, which hinder their growth and development. Agribusiness emerges as a vital driver of rural development [3], [4] by integrating agricultural production, processing [5], and distribution [6], thereby enhancing efficiency and sustainability. This integration not only contributes to job creation and innovation but also improves market access for rural communities, fostering economic resilience and promoting a more equitable distribution of resources and opportunities.

The rationale for this study stems from the growing academic and policy interest in agribusiness as a sustainable strategy for rural development [7], [8], [9], [10], [11]. As global challenges such as food security, climate change, and economic inequality intensify, agribusiness has emerged as a focal point for researchers and policymakers seeking innovative solutions to enhance rural livelihoods [12]. This increasing attention highlights the potential of agribusiness not only to drive economic growth but also to promote environmental sustainability and social equity in rural areas. Understanding the dynamics of agribusiness within the context

of rural development is essential for formulating effective policies and practices that can address these pressing issues.

There is a critical need to assess how research trends in agribusiness and rural development have evolved over the past decade [13], [14]. Despite the burgeoning interest in this field, there remains a lack of consolidated bibliometric evidence that comprehensively captures the scope and impact of research on rural development through agribusiness [15]. By systematically analyzing the existing literature, this study aims to fill this gap, providing valuable insights into the key themes, methodologies, and findings that have shaped the discourse around agribusiness as a driver of rural development. This analysis will not only contribute to the academic understanding of the field but also inform policymakers and practitioners about the most effective strategies for leveraging agribusiness to foster sustainable rural development.

Bibliometric analysis serves as a powerful tool for mapping publication trends, identifying influential authors, countries, journals, and thematic clusters within a specific field of study. By quantitatively assessing the volume and impact of research outputs, bibliometric analysis provides insights into the evolution of academic discourse, highlighting key areas of focus and collaboration among researchers. The justification for utilizing the Web of Science (WoS) database lies in its credibility, extensive coverage of high-quality journals, and standardized indexing practices, which ensure that the data collected is reliable and representative of the global research landscape. This makes WoS an ideal resource for conducting bibliometric studies, as it allows for a comprehensive analysis of the scholarly contributions to agribusiness and rural development, facilitating a deeper understanding of the field's dynamics and trends.

The predominance of the term “rural development” in the keyword analysis underscores its centrality and urgency in current scholarly discourse on agribusiness and regional planning as shown in Fig. 1 [16], [17], [18]. With 48 occurrences substantially exceeding all other terms it reflects the persistent global imperative to address rural economic disparities, promote equitable resource distribution, and enhance livelihoods in non-urban areas. This urgency is amplified by intersecting challenges such as climate change, market volatility, and food security concerns, which demand integrated strategies combining policy innovation, sustainable agricultural practices, and inclusive governance. The keyword’s prominence indicates that rural development is not only a thematic anchor in the literature but also a critical domain for immediate and sustained research investment.

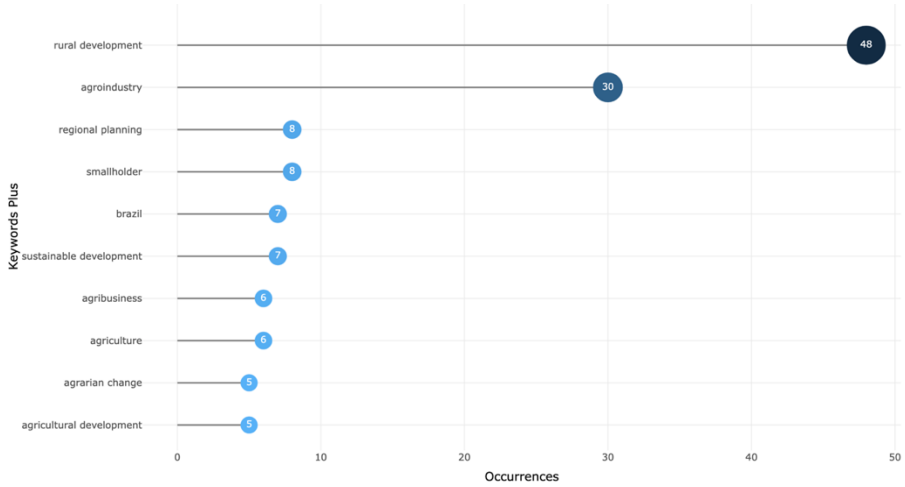

Fig. 1. Keyword frequency analysis highlighting “rural development” as the dominant research focus, reflecting its urgency in addressing socio-economic and sustainability challenges in agribusiness

Several studies highlight the importance of agribusiness in rural development, emphasizing its role in generating employment, income, and sustainable livelihoods [19], [20]. However, these studies are often limited to specific contexts or regions, such as the impact of agribusiness mergers and acquisitions in Ukraine or the development of agrotourism in Indonesia. Additionally, research on agritourism and its economic, social, and environmental benefits is growing, but it remains fragmented and lacks a global synthesis [21], [22], [23]. The bibliometric analyses conducted in these studies reveal emerging themes and trends but do not provide a comprehensive overview of global research trends in agribusiness and rural development.

A decade long bibliometric synthesis is necessary to bridge this gap and provide a systematic overview of global research trends linking agribusiness to rural development. Such a synthesis would help identify key

research areas, influential authors, and prominent journals, as well as highlight the evolution of major research themes over time. For instance, studies on sustainable indicators in agribusiness have increased significantly in recent years, driven by global initiatives such as the UN's 2030 Agenda [24], [25]. Similarly, research on family farming and its role in promoting sustainable agriculture has gained prominence, reflecting a growing recognition of its importance in addressing global challenges [26].

This study addresses that gap by conducting the first comprehensive bibliometric analysis (2015–2025) linking agribusiness and rural development using Web of Science data. By analyzing publication trends, co-authorship networks, keyword co-occurrence, and thematic evolution, this research contributes a consolidated overview of the field. The findings not only highlight motor, basic, niche, and emerging themes but also identify research gaps and future opportunities, offering a roadmap for advancing inclusive and sustainable rural transformation.

The main goal of this research is to extract insights from Web of Science (WoS) data to understand how agribusiness research has contributed to the discourse on rural development over the past decade. By addressing the guiding research question, "What trends, collaborations, and thematic areas emerge from a decade of WoS data on rural development through agribusiness?", the study aims to identify significant patterns in publication trends, collaborative networks among researchers and institutions, and the evolution of key thematic areas within the field. This analysis will provide a comprehensive overview of the contributions of agribusiness research to rural development, highlighting the interplay between these domains and offering valuable insights for future research and policy formulation.

This research paper is structured into five key sections to comprehensively explore the contributions of agribusiness research to rural development discourse over the past decade. Section 1, the introduction, outlines the significance of agribusiness in enhancing rural development and identifies gaps in existing literature, presenting the guiding research question. Section 2 details the methodology, including the search strategy for data collection from the Web of Science (WoS), the inclusion criteria for selecting relevant studies, and the bibliometric tools employed for analysis. In Section 3, the results are presented, highlighting publication trends, country networks that illustrate collaborative efforts, and keyword co-occurrence to identify thematic areas, followed by a discussion interpreting these findings and their policy implications. Section 4 concludes the paper by summarizing the key insights and suggesting future research directions, while Section 5 provides a comprehensive list of references cited throughout the study.

2. METHODS

The methodology presented follows a systematic bibliometric approach to analyze research trends on rural development through agribusiness using the Web of Science (WoS) database. The process begins by defining the topic with specific keywords "rural development" and "agribusiness" and setting clear inclusion criteria. The WoS database was selected due to its high credibility, comprehensive coverage of high-impact journals, standardized indexing, and advanced search capabilities, which ensure the retrieval of reliable and well-curated scholarly literature. Compared to other databases, WoS offers refined filtering by document type, language, and publication year, along with powerful citation tracking features, enabling deeper insights into influential works, authors, and collaborations. The search was conducted across article titles, abstracts, and keywords, covering the period from 2015 to 2025, with no language restrictions, and limited to articles, reviews, and books. A Boolean search string combining "rural development" with terms related to agribusiness, agricultural entrepreneurship, and value chains was applied to maximize coverage. This structured approach ensures both comprehensiveness and accuracy, allowing the study to capture a decade's worth of global research patterns, thematic evolutions, and scholarly impact in the field.

Data extraction was completed on August 8, 2025, an initial 260 records were retrieved. After removing duplicates and irrelevant entries through a manual and automated screening process, 144 records were retained for bibliometric analysis. Data were cleaned in R (bibliometric package) and imported into VOS viewer for co-authorship, keyword co-occurrence, and thematic mapping. This study is limited to the WoS database, which may exclude relevant studies indexed in other databases such as Scopus or Dimensions. However, WoS was selected for its standardized indexing and strong coverage of high-impact journals, which ensures consistency and replicability in bibliometric analysis. The research flowchart method is shown in Fig. 2.

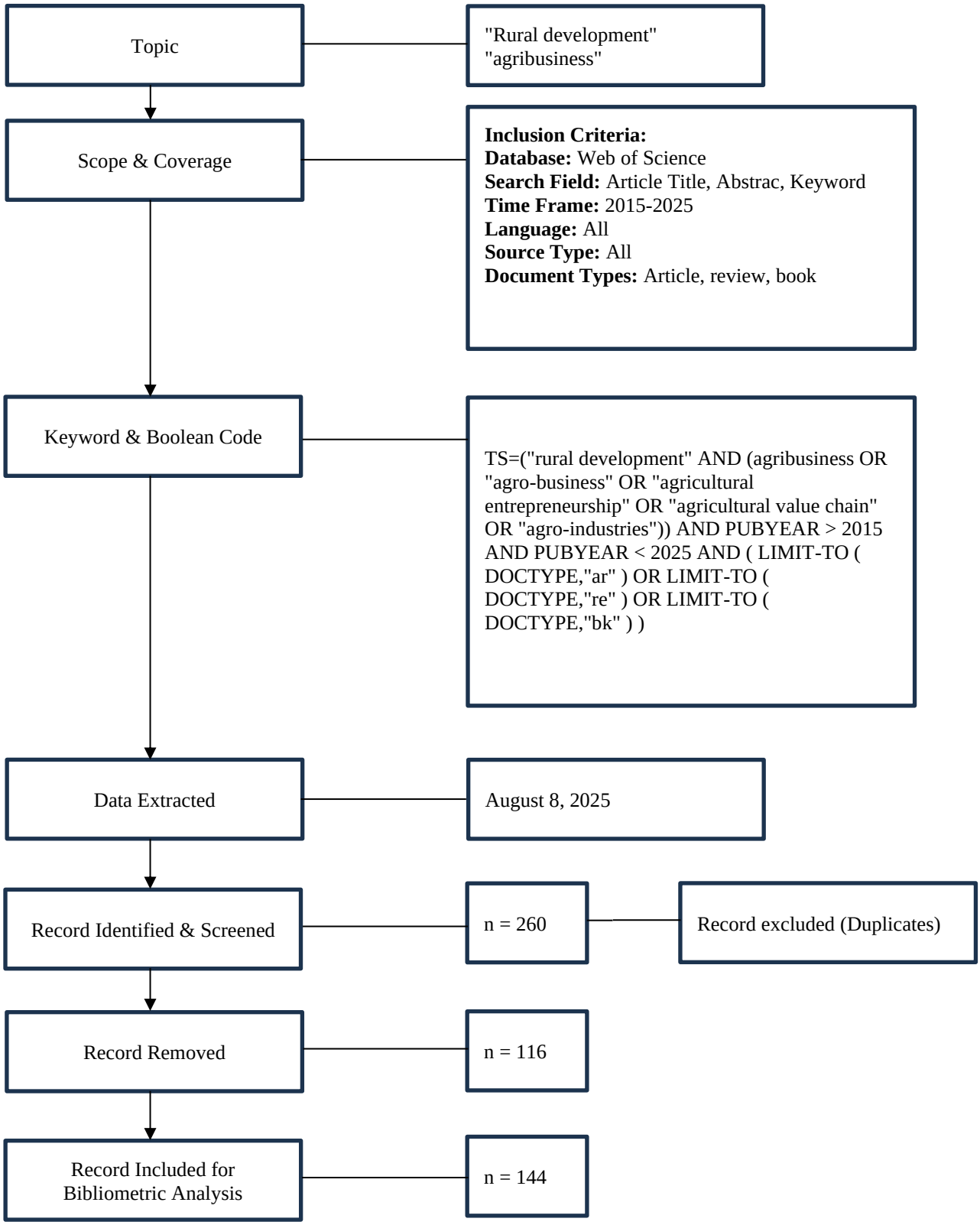

Fig. 2. Flow diagram of Zakaria [27]

Inclusion Criteria:

1. Database: Only records indexed in the Web of Science (WoS) were considered, ensuring high-quality, peer-reviewed scholarly sources.
2. Search Fields: Article Title, Abstract, and Keywords to capture studies directly related to rural development and agribusiness.
3. Keywords & Boolean Logic: Records containing "rural development" combined with terms such as agribusiness, agro-business, agricultural entrepreneurship, agricultural value chain, and agro-industries.
4. Publication Years: 2015–2025, covering a complete decade of research.
5. Language: All languages included to avoid language bias.
6. Document Types: Only journal articles, review papers, and books—these document types generally contain substantial research findings.

Exclusion Criteria:

1. Records outside the 2015–2025 time frame.
2. Publications not indexed in WoS.
3. Conference proceedings, editorials, notes, and other non-research items that typically do not present full research findings.
4. Duplicates retrieved from overlapping search fields.
5. Studies where rural development or agribusiness was only a minor or tangential topic rather than the primary focus.

3. RESULTS AND DISCUSSION

3.1. Main Information

The bibliometric summary of rural development and agribusiness research from 2015 to 2025 (Fig. 3) indicates substantial scholarly activity, comprising 144 documents from 113 sources authored by 465 contributors. The field demonstrates an annual growth rate of 11.61%, with a moderate degree of international collaboration (21.53%) and an average of 3.33 co-authors per paper. The dataset includes 547 author keywords, 8010 references, and exhibits a relatively young average document age of 3.83 years, suggesting recent and dynamic research trends. The average citation rate per document is 8.97, indicating a moderate impact level within the academic community.

Fig. 3. Bibliometric summary of rural development and agribusiness research (2015–2025) showing growth trends, collaboration patterns, and scholarly impact.

The data reflects a growing and vibrant research landscape, with an 11.61% annual growth rate signaling increasing scholarly attention to rural development through agribusiness over the past decade. The moderate international co-authorship rate (21.53%) suggests that while there is notable cross-border collaboration, much of the research remains regionally or nationally focused, potentially due to localized socio-economic and agricultural contexts. The average of 3.33 co-authors per paper points to collaborative research as the norm, aligning with interdisciplinary demands in rural development studies that require integrating economic, environmental, and policy perspectives.

The relatively young average document age (3.83 years) highlights the contemporary nature of the literature, suggesting that current debates and findings are at the forefront of the field. The 547 author keywords indicate a broad thematic diversity, allowing for multifaceted analysis of rural development topics, while the 8.97 citations per document show moderate scholarly influence, potentially reflecting the niche yet increasingly relevant nature of the topic. Moving forward, enhancing international research networks and deepening cross-disciplinary integration could increase both the academic impact and practical applicability of findings in this domain.

3.2. Annual Scientific Production

The annual scientific production on rural development and agribusiness from 2015 to 2025 demonstrates a fluctuating but generally upward trend, with notable peaks in 2017, 2020, and 2024 (Fig. 4). After a decline in 2021, publication output rebounded sharply, reaching its highest point in 2024 before slightly decreasing in 2025. This trajectory reflects both sustained scholarly interest and periods of intensified research activity in the field.

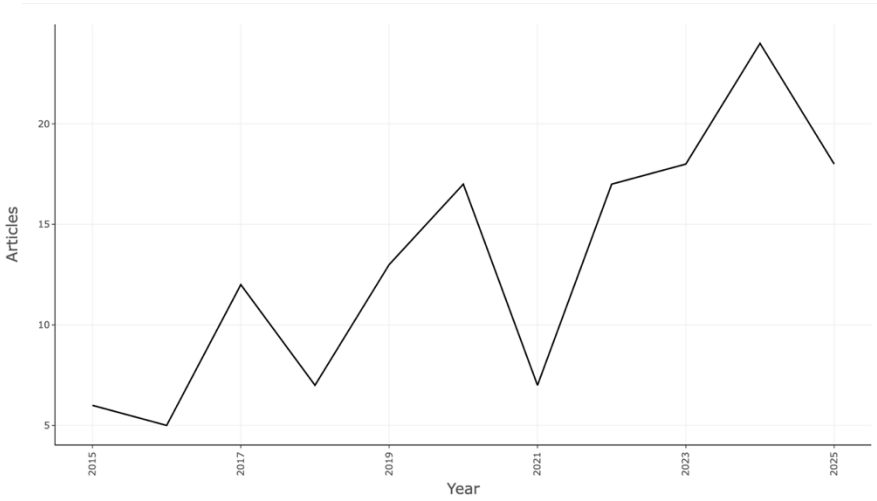

Fig. 4. Annual scientific production (2015–2025) in rural development and agribusiness, showing an overall upward trend with peak output in 2024

The data indicate that scholarly output on rural development and agribusiness has undergone discernible cycles of expansion and contraction over the past decade. These fluctuations appear to be shaped by a confluence of global events, shifting policy priorities, and variations in research funding availability. Periods of reduced output may reflect broader economic uncertainties or changes in institutional and governmental agendas, whereas phases of accelerated publication activity are often aligned with heightened policy interest in rural economies and the strategic role of agribusiness in sustainable development [28]. Such cyclical patterns underscore the sensitivity of the field to both macroeconomic conditions and sector-specific dynamics.

A pronounced resurgence after 2021 suggests a post-pandemic reorientation of academic and policy focus towards rural economic resilience, alongside a rapid intensification of digital and technological applications in agricultural practices. The record high volume of publications in 2024 reflects not only renewed scholarly engagement but also the growing recognition of agribusiness as a central pillar in addressing food security, environmental sustainability, and rural livelihoods. This upward trajectory presents a critical opportunity for sustained growth, if collaborative, interdisciplinary, and cross-sectoral research frameworks are prioritized to ensure the translation of knowledge into tangible policy and practice outcomes.

3.3. Co-occurrence Network

The co-occurrence network visualization generated through VOS viewer identifies “rural development” as the central and most prominent node, reflecting its pivotal role in the research corpus (Fig. 5). The network is structured into multiple color-coded clusters, each representing distinct thematic domains. The red cluster centers on governance, policy, and spatial planning issues, such as “public policy,” “land use planning,” and “agrarian change,” indicating institutional and socio-political dimensions. The blue cluster is oriented toward innovation and production systems, with terms like “contract farming,” “sustainability,” and “innovation,” highlighting the operational and technological aspects of rural transformation. The green cluster emphasizes economic and productivity-oriented themes, including “food security,” “investment,” and “entrepreneurship,” reflecting the economic outcomes of rural development initiatives. The yellow cluster links agribusiness and agroecology with sustainability and smallholder farming, underscoring the intersection between ecological approaches and commercial agricultural systems.

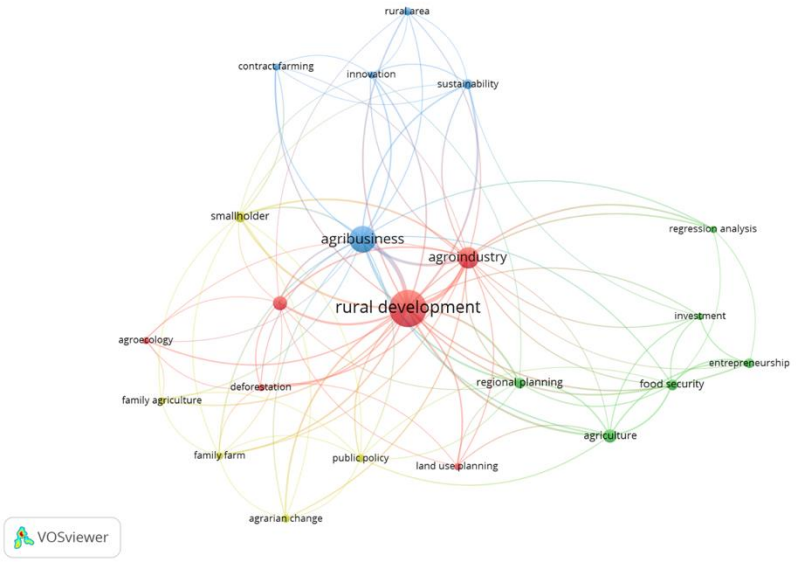

Fig. 5. Co-occurrence network of keywords related to rural development, illustrating thematic clusters linking policy and governance, innovation and production systems, economic outcomes, and sustainability-oriented approaches in the context of agribusiness

The network structure reveals that rural development research is inherently multidisciplinary, encompassing policy, technological, economic, and ecological dimensions. The strong interlinkages between "rural development," "agribusiness," and "agroindustry" suggest that rural transformation is increasingly framed through a lens that integrates commercial agriculture with value-added processing. This is further supported by the connections between agribusiness-related nodes and both innovation-oriented and policy-oriented terms, suggesting that rural development is viewed not merely as a policy objective but as a market-driven and innovation-led process. The prominence of "regional planning" as a bridging node between the red and green clusters reflects the importance of spatial governance in aligning policy, economic activities, and land use.

The integration of the yellow cluster into the broader network indicates that sustainability and ecological approaches, such as agroecology and smallholder farming, remain essential considerations in the context of agribusiness expansion. This suggests that the scholarly discourse is increasingly concerned with balancing economic growth objectives with environmental stewardship and smallholder inclusion [29], [30]. The co-occurrence patterns also highlight emerging research priorities, such as the role of entrepreneurship and investment in enhancing rural livelihoods, and the integration of sustainable practices in commercial agriculture. Collectively, the visualization underscores the need for research and policy frameworks that holistically address governance, technological innovation, market integration, and ecological resilience to achieve long-term, inclusive rural development.

3.4. Focus Research & Keyword Novelty

The overlay visualization illustrates the temporal evolution of research keywords related to rural development in the context of agribusiness, with color gradients representing average publication years from 2020 (purple) to 2022 (yellow) as shown in Fig. 6. Central nodes such as "rural development," "agribusiness," and "agroindustry" dominate the network, while newer emerging themes highlighted in yellow include "entrepreneurship," "investment," and "regression analysis." These emerging terms indicate evolving research interests toward economic modeling, private sector engagement, and innovative strategies for rural transformation, complementing established themes like sustainability, regional planning, and agricultural policy.

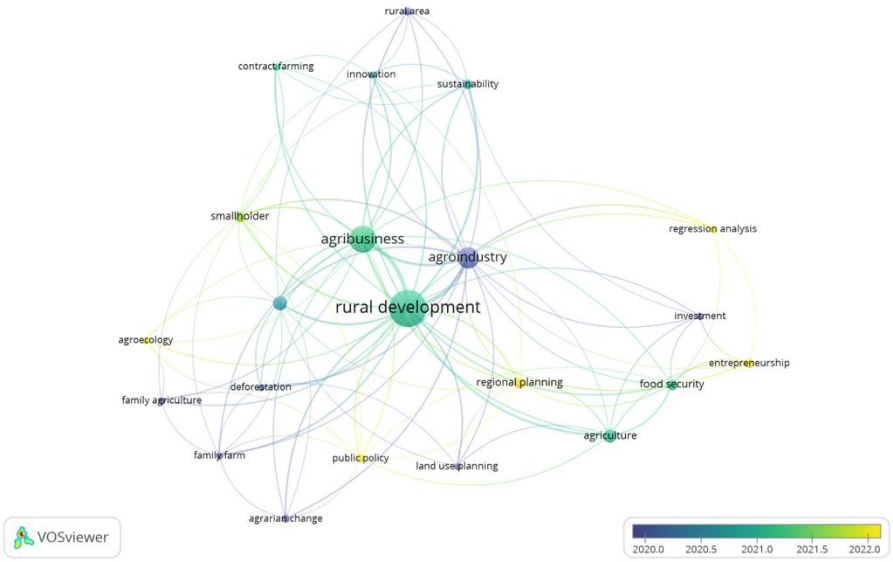

Fig. 6. Overlay visualization of keyword co-occurrence in rural development research, highlighting the emergence of novelty terms such as "entrepreneurship" and "investment" between 2020 and 2022

Keyword novelty shown in Table 1, refers to the emergence of new, distinct, and previously underrepresented terms in the scholarly discourse, indicating evolving research trends and potential future directions in each field. In bibliometric analysis, novelty is identified through temporal mapping such as overlay visualization which detects keywords that have recently gained prominence within the literature. The presence of novelty keywords signals shifts in scholarly priorities, often aligning with technological advances, policy changes, or socio-economic transformations that reshape the research landscape.

Table 1. Keyword novelty

Keyword	Cluster Theme	Average Publication Year	Novelty Indicator	Research Implication	Color Code
Entrepreneurship	Economic & Business Development	2022.0	High	Reflects growing focus on rural enterprise creation and private sector engagement in agribusiness.	Yellow
Investment	Economic Growth & Finance	2021.8	High	Indicates increasing attention to capital mobilization for rural and agribusiness projects.	Yellow
Regression analysis	Data Analytics & Modeling	2021.7	High	Suggests adoption of quantitative modeling to assess rural development impacts.	Yellow-Green
Food security	Socio-Economic & Agricultural Outcomes	2021.5	Moderate	Represents renewed interest in linking agribusiness strategies to rural food system resilience.	Green
Agriculture	Core Production Systems	2021.4	Moderate	Signals continued integration of traditional agriculture within modern rural development agendas.	Green
Regional planning	Governance & Policy	2021.3	Moderate	Highlights spatial governance approaches in recent rural development literature.	Green

In the context of this analysis, the novelty keywords "entrepreneurship," "investment," and "regression analysis" suggest an increased focus on economic development models, capital mobilization, and data-driven approaches to rural development [31], [32]. These emerging topics indicate a movement toward integrating business-oriented and analytical frameworks into agribusiness-related rural transformation strategies. The combination of established governance, sustainability, and agricultural themes with novel economic and analytical concepts highlights an interdisciplinary shift, where future rural development research will likely prioritize market-driven solutions supported by rigorous empirical modeling.

3.5. Thematic Map of Rural Development

The thematic map illustrates four distinct clusters of research themes on rural development and agribusiness, categorized by their development (density) and relevance (centrality) as shown in Fig. 7. Motor themes, located in the upper-right quadrant, such as rural development, agroindustry, and smallholder, are both well-developed and central to the research field, indicating their critical role in driving scholarly discourse. Basic themes like regional planning, agribusiness, and agriculture (lower-right quadrant) are central but less developed, suggesting their foundational importance with room for further conceptual refinement. Niche themes (upper-left quadrant), including decision making, climate change, and cultivation, are specialized and mature but have limited connection to other topics. Emerging or declining themes, such as Nigeria, conceptual framework, and public policy (lower-left quadrant), show low centrality and density, indicating either early-stage exploration or diminishing scholarly attention.

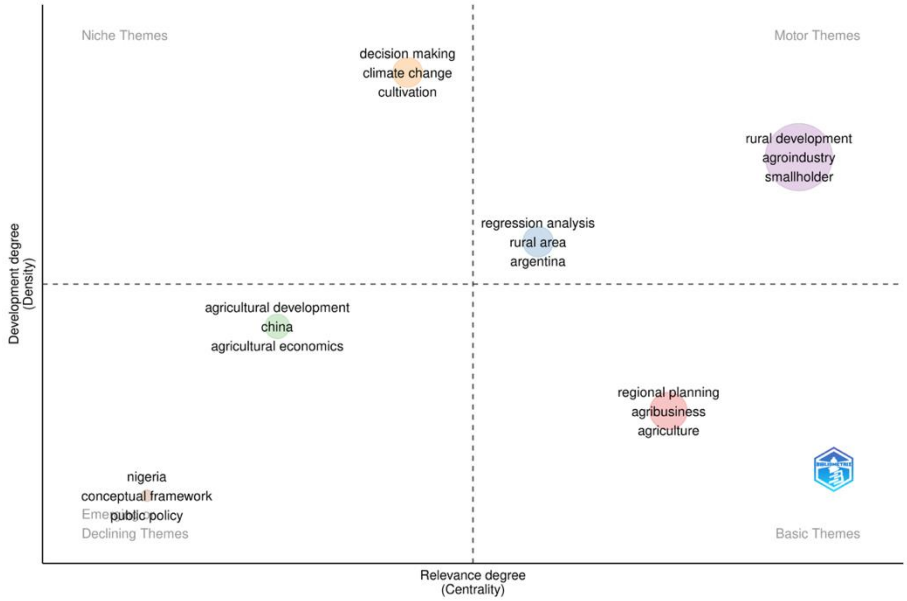

Fig. 7. Thematic map of rural development and agribusiness research based on Web of Science data (2015–2025), generated using R-analysis.

The dominance of motor themes such as rural development, agroindustry, and smallholder highlights the sustained global focus on integrating agricultural production systems with socio-economic development in rural areas. These topics reflect policy and academic interest in sustainable livelihoods, value chain enhancement, and rural transformation [33] [34]. The close clustering of these terms suggests that rural development research is increasingly tied to agribusiness frameworks that leverage industrialization and entrepreneurship to improve rural well-being. The maturity and centrality of these themes indicate that they act as hubs connecting various subfields, making them critical areas for policy design and future empirical studies.

Basic themes like regional planning, agribusiness, and agriculture remain central yet underdeveloped, signaling a gap in the literature where foundational concepts are discussed but not deeply integrated into emerging challenges such as climate resilience, digital transformation, and market globalization. On the other hand, niche themes like decision making and climate change represent mature, specialized areas that could be strategically linked to the motor and basic themes to enrich interdisciplinary understanding [35]. The presence of emerging or declining themes (Nigeria, public policy, conceptual framework) suggests regional or conceptual approaches that are either gaining traction in specific contexts or losing relevance due to shifting

research priorities. Strengthening the integration between these peripheral themes and core topics could foster a more cohesive and innovative body of knowledge on rural development through agribusiness.

3.6. Documents by Type

The publication type distribution indicates that journal articles dominate rural development and agribusiness research output, comprising 91.0% of all documents, followed by reviews at 5.6% and books at 3.5% (Fig. 8). This predominance of articles reflects the field's strong reliance on peer-reviewed journal publications for disseminating empirical findings and theoretical advancements. The relatively smaller share of reviews suggests limited synthesis and meta-analysis work, while the modest proportion of books indicates that comprehensive or in-depth monographs remain a less common format in this domain.

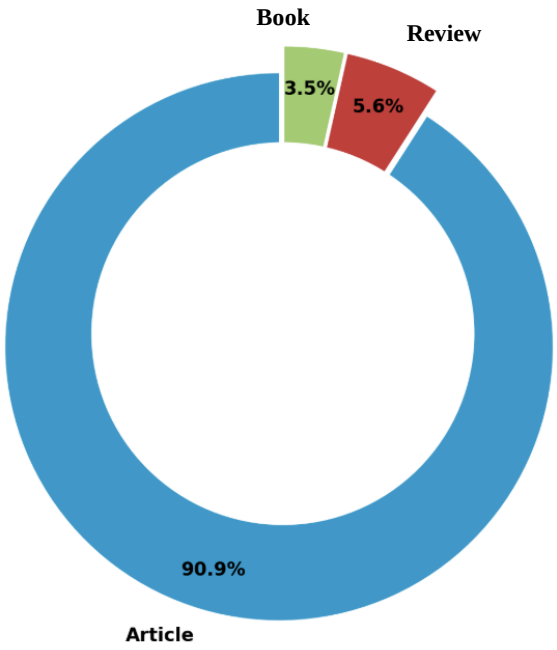

Fig. 8. Distribution of publication types on rural development and agribusiness research in Web of Science (2015–2025)

The high proportion of articles underscores the dynamic nature of rural development and agribusiness research, where scholars prioritize publishing recent findings in journals to rapidly contribute to the evolving discourse. This pattern aligns with broader trends in the agricultural and social sciences, where journal articles serve as the primary medium for academic recognition, citation impact, and international collaboration. However, the limited number of reviews implies a potential gap in consolidating and critically assessing the growing body of literature, which could help establish stronger conceptual frameworks and identify underexplored areas.

The relatively small percentage of books suggests that extended, holistic treatments of rural development and agribusiness issues are less common, possibly due to the time-intensive nature of book writing and the academic emphasis on journal publications for career progression [36]. Nevertheless, books could play an important role in bridging academic research with policy and practice by providing comprehensive, context rich perspectives. Increasing review studies and book publications could strengthen the field by offering integrative insights and fostering interdisciplinary linkages between agribusiness, rural policy, and sustainable development strategies.

4. CONCLUSION

This bibliometric analysis of Web of Science data (2015–2025) provides the first decade-long synthesis of global research linking agribusiness and rural development. The study demonstrates an average annual growth of 11.61%, moderate international collaboration (21.53%), and the prominence of themes such as rural development, agroindustry, and smallholder farming. At the same time, foundational areas like regional planning and agriculture remain underdeveloped, while emerging keywords such as entrepreneurship,

investment, and regression analysis signal a shift toward market driven and data informed approaches. This study adds to the literature by consolidating fragmented research, mapping thematic evolution, and identifying conceptual gaps in rural development studies through agribusiness. It provides a structured overview of how the field has progressed over the past decade, offering a basis for comparative analyses and interdisciplinary dialogue.

The findings highlight the need for funding and policy frameworks that encourage cross-sectoral collaboration, digital transformation in agribusiness, and integration of climate-smart and sustainable practices. Policymakers can draw on these insights to prioritize investments in entrepreneurship, smallholder inclusion, and data driven planning for rural transformation. Future studies should expand the scope by conducting cross-database analyses (e.g., Scopus, Dimensions) to capture a broader spectrum of global research. Comparative bibliometric studies across regions could also shed light on contextual differences in agribusiness driven rural development. Moreover, synthesizing evidence through systematic reviews and meta-analyses would strengthen conceptual frameworks and guide policy design.

Author Contribution
All authors contributed.

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